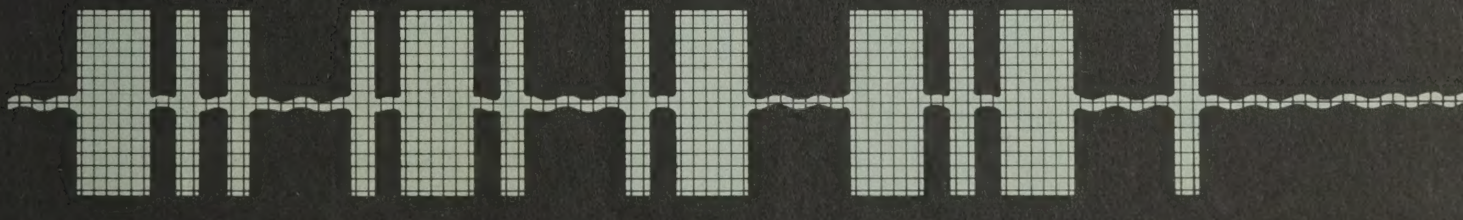
JANUARY 1977

DRAKE®

Equipment for Radio Communications



FULL LINE CATALOG

DRAKE®

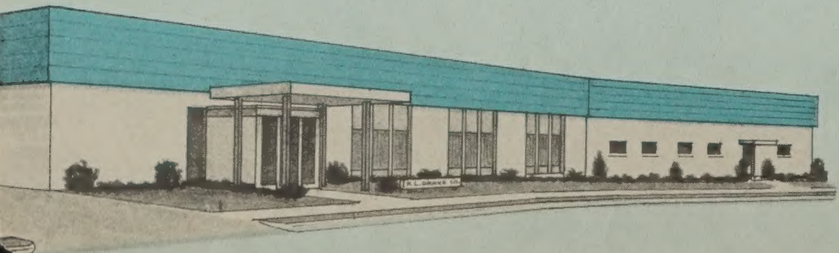
Known throughout the world for quality...

Radio Communications Equipment

Seeking a better way, in 1943 a young electrical engineer, with a significant background in radio design for major industrial concerns, launched the R.L. DRAKE COMPANY.

From a modest beginning, Robert L. Drake guided the growth of his company to a position of international importance in the communications field. Today, all over the world, wherever radio communications equipment is used, the name DRAKE is held in high esteem.

The extraordinary acceptance of DRAKE products rests on a solid foundation of customer satisfaction . . . in the outstanding performance of Drake Radio products.



R. L. DRAKE COMPANY
540 Richard Street, Miamisburg, Ohio 45342
Phone (513) 866-2421 • Telex 288-017

Drake Directional RF Wattmeters

Model No. 1513
Drake W-4
1.8-54 MHz

Model No. 1515
Drake WV-4
20-200 MHz

Drake directional, through line wattmeters, using printed circuits, toroids, and state of the art techniques, permit versatile performance and unsurpassed accuracy, yet at a lower cost.

In contrast to VSWR measuring devices of the past, Drake wattmeters are frequency insensitive throughout their specified range, requiring no adjustments for power or VSWR measurements.

Negligible insertion loss allows continuous monitoring of either forward or reflected power for fast accurate tune up and checking of transmitter-antenna performance.

Indirectly measure radiated power (forward power minus reflected power) and VSWR by means of a plastic nomogram included.

Each wattmeter makes possible quick, accurate adjustments of antenna resonance and impedance match, when placed between transmitter and matching network.

High accuracy; ideal as laboratory instruments.

Removable coupler allows remote metering.

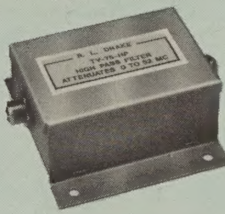
Specifications	W-4	WV-4
Frequency Coverage	1.8-54 MHz	20-200 MHz
Line Impedance	50 ohm resistive	50 ohm resistive
Power Capability	2000 W continuous	1000 W continuous
Jacks, Removable Coupler	Two S0239 input and output connectors	Type N input and output connectors.
Semiconductors	Two 1N295 power meter rectifiers	Two 1N695 power meter rectifiers
Accuracy	± (5% of reading +1% of full scale)	
VSWR Insertion	Insertion of wattmeter in line changes VSWR no more than 1.05:1	
Size—Cabinet:	6"H x 3.7"W x 4"D (15.3 x 9.4 x 10.2 cm)	
Coupler:	2.3"H x 3.5"W x 2.5"D (5.7 x 8.9 x 6.4 cm)	
Shipping—Weight:	3 lbs. (1.4 kg)	
Size:	8 x 5.8 x 7" (20.3 x 14.6 x 17.8 cm)	
CONTROLS	Front panel 4 position switch selects scale and reflected power.	

Drake TVI Filters

High Pass Filters for TV Sets

provide more than 40 dB attenuation at 52 MHz and lower. Protect the TV set from amateur transmitters 6-160 meters.

Model No. 1603
Drake TV-300-HP
For 300 ohm twin lead

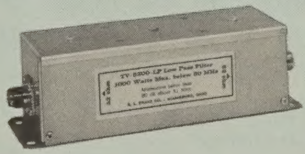


Model No. 1610
Drake TV-75-HP
For 75 ohm TV coaxial cable; TV type connectors installed

Low Pass Filters for Transmitters

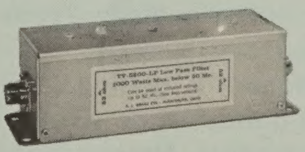
have four pi sections for sharp cut off below channel 2, and to attenuate transmitter harmonics falling in any TV channel and fm band. 52 ohm. SO-239 connectors built in.

Model No. 1608 **Drake TV-3300-LP**



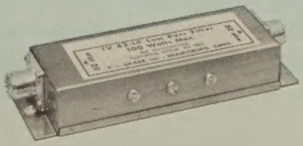
1000 watts max. below 30 MHz. Attenuation better than 80 dB above 41 MHz. Helps TV i-f interference, as well as TV front-end problems.

Model No. 1609 **Drake TV-5200-LP**



200 watts to 52 MHz. Ideal for six meters. For operation below six meters, use TV-3300-LP or TV-42-LP.

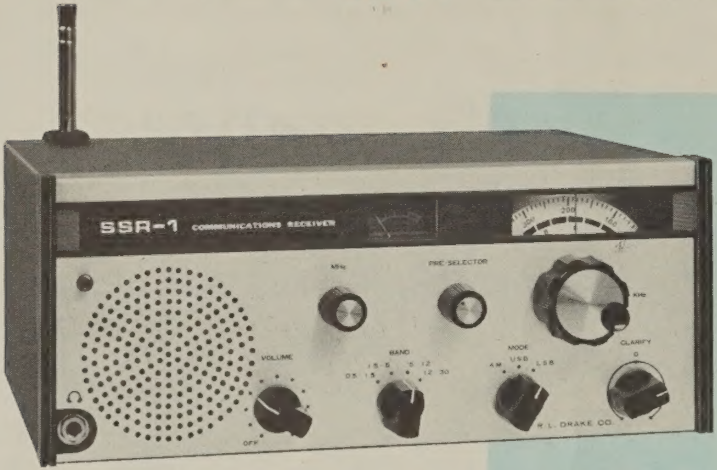
Model No. 1605 **Drake TV-42-LP**



is a four section filter designed with 43.2 MHz cut-off and extremely high attenuation in all TV channels for transmitters operating at 30 MHz and lower. Rated 100 watts input.

Model No. 8201

Drake SSR-1



- **Synthesized**
- **General Coverage**
- **Low Cost**
- **Selectable Sidebands**
- **All Solid State**
- **Built-in Ac Power Supply**
- **Excellent Performance**

The SSR-1 Receiver provides precision tuning over the short wave spectrum of 0.5 to 30 MHz with capability of reception of a-m (amplitude modulated), cw (continuous wave) and ssb (upper and lower single side band) signals.

A synthesized/drift-cancelling 1st mixer injection system giving thirty tunable ranges from 0.5 to 30 MHz is derived from a single 10 MHz crystal oscillator providing frequency stability necessary for ssb operation.

A stable low frequency VFO tunes each of the 30 one-MHz ranges with a dial accuracy of better than 5 kHz which is sufficient to locate and identify a station whose frequency is known.

Separate detectors (product and diode) are used to provide for best performance whether listening to ssb or a-m signals. Narrow band selectivity for ssb and wide band selectivity for a-m reception is provided.

A manual tuned preselector provides for maximum sensitivity and maximum interference rejection.

Solid state circuitry throughout allows efficient operation from built-in ac power supply, internal batteries or external 12 V-dc source.

FRONT PANEL CONTROLS

MHz: Sets the MHz range of the received frequency. This control tunes the smaller inner dial (1) and is adjusted for the center of the desired MHz range.

Signal Meter: Indicates relative rf input signal level.

Pre-selector: Adjusts receiver rf tuned circuits for proper reception of signal. This control is tuned for maximum signal or noise at the selected frequency.

Frequency Display: Indicates tuned frequency.

The inner dial indicates MHz range and the outer dial indicates kHz reading. As an example: 5.750 MHz.

kHz: Tunes the kHz range of the receiver. This control turns the large outer dial (2) and is adjusted for the proper frequency as displayed on the graduations. This dial has a graduated scale from 000 to 1000 and is read as 0 to 1000 kHz or .000 to 1.000 MHz.

Clarify: Provides ultra fine frequency adjustment (approximately ±3 kHz range). This control is used primarily on ssb and cw signals for setting the pitch or sound accurately after the station has been roughly tuned in. It should be in the center position before any tuning is commenced.

Mode: Selects mode of reception. A-m (amplitude modulation), usb (upper single side band) and lsb (lower single side band). Cw (continuous wave) may be received on either usb or lsb position. The mode selector selects the proper detector (product detector for ssb and diode detector for a-m and i-f selectivity filter.

Band: Selects the proper range of received frequency.

Off-Volume: Turns radio on and off and adjusts audio output level.

Phone Jack: For ear phone reception or external speaker (8 ohms). Insertion of jack disconnects internal speaker.

Pilot Lamp Switch: On ac operation the pilot lamps are always lighted. The pilot lamps are normally extinguished on battery operation to conserve battery life. Pushing this momentary action switch turns on the pilot lamps.

Built-in Telescoping Antenna: The SSR-1 has such sensitivity that it operates near maximum practical limits. For optimum results, the receiver should be connected to an external antenna.

BACK PANEL CONTROLS

Record, External Battery, Mute Jack, Antenna Terminal Strip, Antenna Attenuator, Fuse.

DRAKE SSR-1 SPECIFICATIONS

I-f Rejection:
Greater than 50 dB @ f_d below 20 MHz.
Greater than 40 dB @ f_d above 20 MHz.

Antenna: Self contained telescopic whip antenna. External connection to terminal strip. (75 ohm input impedance—unbalanced.)

Frequency Coverage: 0.5 to 30 MHz in 30 ranges each tunable over 1 MHz range with a dial having 10 kHz graduations.

Reception Modes: Cw, usb, lsb, a-m.

Sensitivity: At least 10 dB S+N/N under the following conditions:

Mode	Freq.	Input Level*
Ssb	0.5-2 MHz	1.0µV
	2-30 MHz	0.3µV
A-m	0.5-2 MHz	3.0µV
	2-30 MHz	1.0µV

(A-m: 1000 Hz @ 30% modulation.)

Output: Capable of 200 mW output on ssb at 2 MHz with input signal of 0.5µV and 2 watts output with 5µV input.

Audio Distortion: Less than 5% @ 2 watts.

Calibration Accuracy: Within 5 kHz at all frequencies.

Selectivity Mode	Bandwidth 6 dB
Ssb	3 kHz ±25%
A-m	5.5 kHz ±25%

Image Rejection: Greater than 50 dB

Audio Output Provisions: Internal 8 ohm speaker and phone jack on front panel that disables speaker when plugged in.

Muting Provisions: External mute jack (RCA type) that provides normal reception with closed circuit and mute with open circuit connections.

Power Supply: 8 type "D" (1.5 V) dry cell batteries (not included). Tapped transformer to provide operation from 117 V ±15% or 240 V ±10%-20%, 50-60 Hz source with automatic switch over to batteries when ac line is disconnected.

Current Consumption: Less than 100 mA quiescent at 12 V-dc.

Dial Lights: Momentary push button to light when on battery operation. Always on for ac operation.

Clarifier: Tunes minimum of ±2 kHz and maximum of ±5 kHz.

Size: 5.5″H x 13″W x 11″D (14 x 33 x 28 cm).

Weight: 14 lbs. (6.4 kg)

**These voltages are ½ the open circuit signal generator voltage, i.e., the voltage read on the meter of a HP Model 606 Generator.*

ACCESSORIES AVAILABLE:

Model No. 7078 **Drake HS-1 Headphones,**
Model No. 8202 **Drake DC-PC Dc Power Cord,**
Model No. 1237 **Drake AN-5 Antenna Kit,**
Model No. 7040 **World Radio & TV Handbook.**

Model No. 1221 Drake SPR-4

- **Programmable to meet specific requirements: SWL, Amateur, Laboratory, Broadcast, Marine Radio, etc.**
- **Direct frequency dialing: 150-500 kHz plus any 23 500 kHz ranges, 0.5 to 30 MHz**
- **FET circuitry, all solid state**
- **Linear dial, 1 kHz readout**
- **Band-widths for cw, ssb, a-m with built-in LC filter**
- **Crystals supplied for LW, seven SW, and bc bands**
- **Notch filter**
- **Built-in speaker**

The Drake model SPR-4 communications receiver may be programmed to suit your present and future needs. It is ideal for short wave listening or monitoring, aircraft radio and weather, marine ship and shore stations, hf communications, WWV time signals, CB, standard broadcast monitoring or DXing, amateur radio, civil defense, government, or use as a laboratory instrument.

In designing the SPR-4, Drake engineers incorporated the dual gate FET to produce the first no-compromise solid state receiver. Unlike receivers with bipolar transistors which have poor cross-modulation, intermodulation, agc, and overload performance; the SPR-4 has signal handling capabilities superior to the best tube receivers. In addition, the SPR-4 has all of the advantages of a solid-state design such as low power consumption, mechanical and thermal stability, reliability, etc.

The SPR-4 comes with ten bands installed which cover long wave, standard broadcast, and seven shortwave broadcast bands. Other bands, each with 500 kHz tuning range, can be added by purchasing a crystal which comes with an adhesive transparent dial sector for that range. A total of 24 bands are possible from 150 kHz to 30 MHz.

The main tuning dial reads 0 to 500 kHz with 1 kHz graduation marks using two concentric transparent discs, 0 to 100 kHz is indicated on one disc and hundreds of kHz are indicated on the other disc.

DRAKE SPR-4 SPECIFICATIONS

Frequency Coverage: Can be programmed with accessory crystals for 23 ranges (each tuning a 500 kHz band) from 0.5 to 30 MHz plus 150 to 500 kHz. Crystals supplied with the receiver allow coverage on these ranges: 150-500 kHz, 0.5-1.0 MHz, 1.0-1.6 MHz*, 6.0-6.5 MHz, 7.0-7.5 MHz, 9.5-10 MHz, 11.5-12 MHz, 15-15.5 MHz, 17.5-18 MHz, 21.5-22 MHz.

Modes of Operation: A-m, cw, lsb, usb, (RTTY with RY-4 accessory installed).

Selectivity: A-m: 4.8 kHz @ -6 dB, 10 kHz @ -60 dB. Ssb: 2.4 kHz @ -6 dB, 7.2 kHz @ -60 dB. Cw: 0.4 kHz @ -6 dB, 2.7 kHz @ -60 dB.

Intermediate Frequencies: 1st i-f 5645 kHz four pole crystal lattice filter, 2nd i-f 50 kHz four pole Hi-Q Ferrite LC filter.

Frequency Stability: At room temperature, drift for all causes (including ± 10% change in supply voltage) is less than ± 100 Hz.

Sensitivity: Ssb and cw: 0.25 microvolt for 10 dB S+N/N, a-m: 0.5 microvolt with 30% modulation for 10 dB S+N/N.

Image Rejection: Greater than 60 dB below 15 MHz. Greater than 50 dB above 15 MHz.

Blocking: An undesired unmodulated signal at least 20 kHz above or below a desired signal of .25 microvolt must be 90 dB stronger than the .25 microvolt signal to cause a 3 dB reduction of the signal to noise ratio of the desired signal.

Cross Modulation: An unwanted signal (modulated 30% at 1 kHz) removed by at least 20 kHz from a desired signal of 1 microvolt, must have a signal level of at least 10 millivolts to produce a noticeable crossmodulation of the desired signal.

Intermodulation: Using a reference signal of .25 microvolt, two interfering signals of equal strength within the passband of the receiver front-end selectivity must each have a strength of at least 65 dB above the reference signal to produce third order products equal to the .25 microvolt reference signal.

Automatic Gain Control: Agc is used on a-m, cw, and ssb. Time constants are selected for the optimum effectiveness on each mode. Audio output is held constant to 6 dB over a 100 dB range of input signals. Jumper wire allows choice of fast or slow release on cw.

Input Impedance: 50 ohms approximately (high impedance 150 kHz to 1500 kHz)

Excessive Rf Input Voltage Protection: Withstands 30 volts rms from a 50 ohm generator continuously.

Output Power: 3 watts into 4 ohm load (less into higher impedance loads).

Power Consumption: 18 watts on 120 V-ac or 5¾ watts on 12 V-dc, 2.5 watts on 12 V-dc with dial lights turned off and with audio output adjusted for normal listening level.

Calibration: Dial is accurate to better than ± 1 kHz when calibrated at nearest 100 kHz calibration point.

Hum and Noise: More than 60 dB below rated output.

Size and Weight: 5.5″H x 10.8″W x 12.3″D (14 x 27.4 x 31.2 cm), 18 lbs (8.2 kg).

**Generous overtravel gives additional 50 kHz or more off each end of range.*

ACCESSORIES

Matching Speaker: Same size as SPR-4, has 5 x 7 speaker. Model No. 1511 Drake MS-4.

Calibrator: Plug-in 100 kHz crystal oscillator with harmonics that occur at 100 kHz intervals throughout the range of SPR-4. Model No. 1223 Drake SCC-4.

Noise Blanker: Plug-in i-f type noise blanker mutes receiver for duration of each noise pulse. 16 transistors, 2 diodes. Model No. 1227 Drake 5-NB.

Loop Antenna: Directional antenna nulls out undesired stations, plugs into receptacle through top of the cabinet, operates from 150 kHz to 1600 kHz only. Model No. 1235 Drake AL-4.

Antenna Kit: Consists of wire, insulators, lead-in, and instructions. Model No. 1237 Drake AN-5.

Dc Power Cord: Plugs into cigar lighter in an automobile, allows SPR-4 to be used on 12 volts dc supply. Model No. 1229 Drake DC-PC.

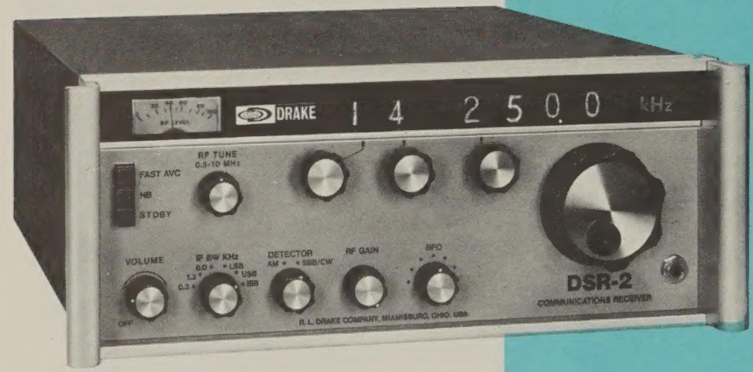
Teletype Adapter: Allows reception of standard teletype tones 2125/2975 Hz and 2125/2295 Hz by remote shifting BFO. Model No. 1225 Drake RY-4.

Transceive Adaptor: Allows SPR-4 to transceive with all T-4 and T-4X Transmitters. Consists of printed circuit board and connectors. Model No. 1224 Drake TA-4.

Headphone: Model No. 7078 Drake HS-1.

Model No.
1242

Drake DSR-2



- **Continuous Coverage 10 kHz to 30 MHz**
- **Digital Synthesizer Frequency Control**
- **Frequency Displayed to 100 Hz**
- **All Solid State**
- **A-m, Ssb, Cw, RTTY, Isb**
- **Series Balanced Gate Noise Blanker**
- **Front End Protection**
- **Optional Features Available on Special Order**

The R. L. Drake Model DSR-2 Receiver is a high grade communications receiver employing the most up-to-date solid state devices and circuitry. It provides continuous coverage from 10 kHz to 30 MHz. The received frequency is displayed on six nixie tubes to the nearest 100 Hz.

Frequency injections of the DSR-2 are controlled by a phase-locked digital synthesizer which allows incremental frequency selection in 10, 1, and 0.1 MHz steps. The remaining 0 to 0.1 MHz is continuously adjustable by a highly stable variable oscillator controlled from the fine tuning knob on the front panel. Modular construction on easily accessible printed circuit boards is used throughout the DSR-2. Extensive use of dual gate MOSFET transistors in the DSR-2 circuitry contributes to its superior intermodulation, avc, wide dynamic range and overload performance.

The front panel controls allow the operator to select frequency (with fine tune control), a-m or ssb product detector, i-f bandwidth, af gain, BFO pitch, fast or slow avc, manual rf gain, standby position, and the highly effective Drake series gate noise blanker. Isb (Independent Sideband) is a built-in feature of the DSR-2. Separate i-f crystal filter, i-f amplifier, and audio output circuits allow two simultaneous communication channels to be employed on one frequency assignment, doubling the information receiving capacity.

Front-end protection includes special circuitry built-in to provide protection against transmitters

in close proximity. It will withstand a 30 volt emf from a 50 ohm source, with the receiver on or off.

The normal avc system has appropriate attack and decay times to provide proper clean reception of ssb and cw signals. This avc system operates on both the rf and i-f circuitry to provide reception free of 'popping.' The rf avc provides an additional control under very strong signal conditions to increase the dynamic range. Front panel controls are available to decrease the decay time of the avc circuitry, to disconnect the avc circuitry and to provide manual control.

DRAKE DSR-2 SPECIFICATIONS

Frequency Range: 10 kHz to 30 MHz continuous range.

Modes of Operation: Usb, lsb, cw, RTTY, a-m, isb.

Frequency Readout: Complete to 100 Hz on six Nixie tubes.

Frequency Selection: 10 MHz, 1 MHz, 0.1 MHz steps switch selected. 0 to 0.1 MHz continuously variable.

Frequency Stability: Frequency drift does not exceed 200 Hz in any 8 hour period at constant ambient temperature between 0° and 40°C and ± 10% variation from nominal line voltage after ½ hour warmup.

Sensitivity: 0.01—0.5 MHz: Less than 4 microvolts for 10 dB SINAD at 2.4 kHz ssb mode. Less than 25 microvolts for 10 dB SINAD at 6 kHz a-m mode with 30% modulation. 0.5—30 MHz: Less than 0.3 microvolts for 10 dB SINAD at 2.4 kHz ssb mode. Less than 2 microvolts for 10 dB SINAD at 6 kHz a-m mode with 30% modulation.

Image Rejection: Greater than 60 dB relative to 1 microvolt below 10 MHz. Greater than 50 dB relative to 1 microvolt above 10 MHz.

I-f rejection: Greater than 60 dB relative to 1 microvolt except in range of 4.5 to 5.5 MHz.

Rf Blocking: Greater than 100 dB relative to 1 microvolt.
*Desired signal at 60 dB above 1 microvolt with a blocking signal removed 20 kHz and its amplitude adjusted to reduce desired signal 3 dB.

Crossmodulation: 70 dB relative to 1 microvolt.
*Desired signal at 60 dB above 1 microvolt with undesired signal removed 20 kHz and its amplitude adjusted for crossmodulation products 30 dB lower than desired signal.

Intermodulation: 70 dB relative to 1 microvolt.
*Level of two undesired signals, removed at least 30 kHz from the desired frequency, required to produce the equivalent audio output as desired signal 30 dB greater than 1 microvolt.

Opposite Sideband Suppression: Greater than 60 dB at 500 Hz into the opposite sideband.

I-f Bandwidth (in kHz):

Selectivity	**−6 dB**	**−60 dB**
6	6	11.5
2.4	2.4	4.3
1.2	1.2	2.4
0.3	0.3	0.6

Optional filters available for other bandwidths.

Automatic Volume Control: Audio output increases less than 3 dB for an rf input change of 100 dB.

Attack Time	1 millisecond
Release Time: (normal avc)	1 second
(fast avc)	100 milliseconds

Antenna Input Impedance:

10 kHz to 500 kHz	1000 ohms
500 kHz to 30 MHz	50 ohms

Antenna Input Protection: The receiver has built-in protection to prevent damage from a 30 volt signal applied to the antenna for a 15 minute period.

Audio Output: Communications channel: 2 watts at 5% maximum distortion into 4 ohm load (4 ohms unbalanced). 1 milliwatt into 600 ohm load (600 ohms balanced and center tapped). Isb channel: 1 milliwatt into 600 ohm load (600 ohms balanced and center tapped).

Audio Hum and Noise: Greater than 60 dB below rated output.

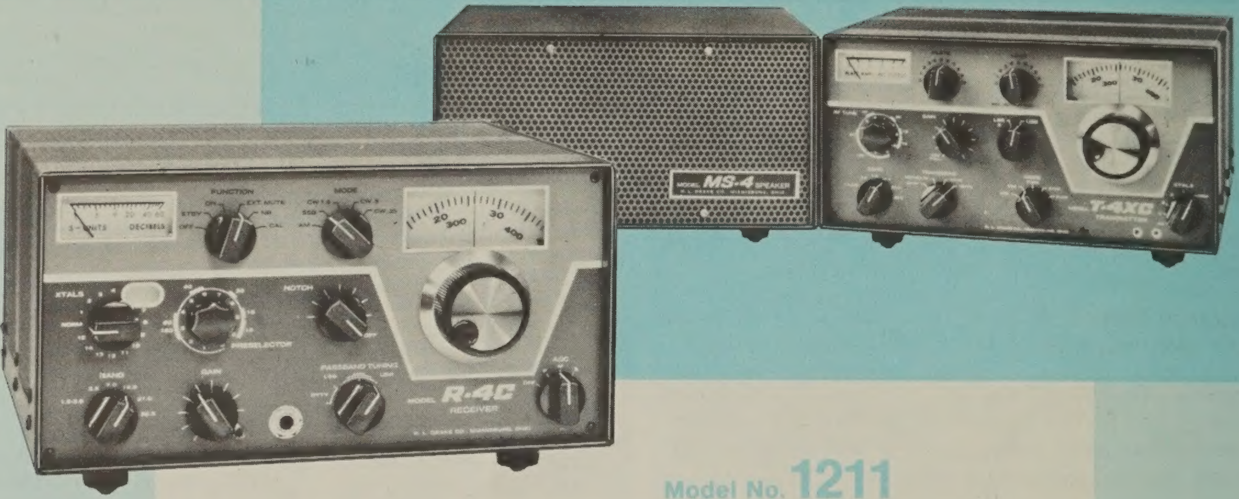
BFO: Derived from 5 MHz standard oscillator, or variable over a ± 3 kHz range from front panel control.

Power Requirements: 120/240 volts ± 10% single phase 50 to 420 Hz, 35 watts.

Dimensions: 5.5″H x 13.4″W x 15″D (14 x 34 x 38 cm).

Weight: 17 lbs (7.7 kg).

**Measurement Procedure*



Model No. 1211

Drake R-4C

Solid State Linear permeability-tuned VFO with 1 kHz dial divisions. Gear driven dual circular dials. High mechanical, electrical and temperature stability.

Covers ham bands with crystals furnished. Covers all of 80, 40, 20 and 15 meters, and 28.5-29.0 MHz of 10 meters.

Covers 160 meters with accessory crystal. In addition to the ham bands, tunes any fifteen 500 kHz ranges between 1.5 and 30 MHz, 5.0 to 6.0 MHz not recommended. Can be used for MARS, WWV, CB, Marine and Shortwave broadcasts.

Superior selectivity: 2.4 kHz 8-pole filter provided in ssb positions. 8.0 kHz, 6 pole selectivity for a-m. Optional 8-pole filters of .25, .5, 1.5 and 6.0 kHz bandwidths available.

Tunable notch filter attenuates carriers within passband.

Smooth and precise passband tuning.

Transceive capability; may be used to transceive with the T-4X, T-4XB or T-4XC Transmitters. Illuminated dial shows which PTO is in use.

Usb, lsb, a-m and cw on all bands.

Agc with fast attack and two release times for ssb and a-m or fast release for break-in cw. Agc also may be switched off.

New high efficiency accessory noise blanker that operates in all modes.

Crystal lattice filter in first i-f prevents cross-modulation and desensitization due to strong adjacent channel signals.

Excellent overload and intermodulation characteristics.

25 kHz Calibrator permits working closer to band edges and segments.

Scratch resistant epoxy paint finish.

DRAKE R-4C SPECIFICATIONS

Frequency Coverage: 3.5-4.0 MHz, 7.0-7.5 MHz, 14.0-14.5 MHz, 21.0-21.5 MHz and 28.5-29.0 MHz with crystals supplied. Fifteen accessory crystal sockets are provided for coverage of any 15 additional 500 kHz ranges between 1.5 and 30.0 MHz with the exception of 5.0-6.0 MHz.

Selectivity: Ssb—2.4 kHz at 6 dB down, 4.2 kHz at 60 dB down. A-m—8.0 kHz at 6 dB down, 28.0 kHz at 60 dB down. Filters with 0.25, 0.5, 1.5 and 6.0 kHz bandwidths at the −6 dB points are available for the cw1, cw2 and a-m modes. Product detection is used in the ssb, cw1 and cw2 modes; diode detection is used in the a-m mode. Agc switching is independent of mode switching.

I-f Frequencies: First i-f 5645 MHz wth 4-pole crystal filter. **Second** i-f 5695 MHz with 8-pole cyrstal lattice filter, and **third** i-f is 50 kHz with 2 LC tuned circuits.

Stability: Less than 100 Hz after warm-up. Less than 100 Hz for 10% change in line voltage.

Sensitivity: Less than 0.25 μV for 10 dB signal plus-noise-to-noise on all amateur bands. Less than 0.5 μV at any frequency.

Modes of Operation: Ssb, cw, a-m, RTTY, SSTV.

Dial Calibration: Main dial is calibrated from 0 to 500 kHz in 1 kHz increments. Calibration Accuracy: Better than 1 kHz when calibrated to the nearest 100 kHz point. Markers are at 25 kHz for greater accuracy.

Automatic Gain Control: Amplified agc has fast attack (less than 1 ms) and 3 selectable release times. Slow release is 1.0 second, medium release is 350 ms, and fast release is 50 ms. Audio output increases not more than 3 dB for 100 dB rf input change. (1 μV to 0.1 volt).

Audio Ouput: At least 2.0 watts into a 3.2 ohm load. 3000 ohm output available for anti-VOX.

Antenna Input Impedance: 52 ohms nominal.

Spurious Repsonses: Image rejection more than 70 dB; i-f rejection more than 70 dB on amateur ranges. Internal spurious ranges in amateur bands less than the equivalent of the 1 μV signal at the antenna.

Power Consumption: 60 watts, 120/240 V-ac, 50 to 400 Hz.

Dimensions: 5.5″H x 10.8″W x 11.7″ cabinet depth, 12.8″ overall depth (14 x 27.3 x 32.4 cm).

Weight: 17 lbs (7.7 kg).

CONTROLS AND JACKS

Front Panel: Main tuning, agc switch, passband tuning, notch filter, mode switch, function switch, preselector tuning, af and rf gain controls, bandswitch, accessory crystal switch and headphone jack.

Rear Panel: S-meter zero control, crystal filter sockets, auxiliary crystal sockets, accessory power socket, 120/240 V-ac power switch, line fuse, carrier oscillator jack, antenna jack, speaker jack, mute jack, anti-VOX/sidetone jack, PTO lamp jack and transmitter carrier oscillator jack.

C-Line Accessories

Model No. 1511

Drake MS-4 Matching Speaker

(Shown on facing page) for use with R-4, R-4A, R-4B and R-4C Receivers. (Has space to house AC-3 and AC-4 Power Supplies).

Power Supplies for T-4, T-4X, T-4XB or T-4XC (The AC-4 can be housed in an MS-4 speaker cabinet).
Model No. 1501 Drake AC-4
Model No. 1505 Drake DC-4

Accessory Bandwidth Filters available: Model No. 7011 Drake FL250, Model No. 7013 Drake FL500, Model No. 7015 Drake FL1500, Model No. 7017 Drake FL4000, Model No. 7019 Drake FL6000.

Linear Amplifier see page 15

RF Wattmeters see page 3

Matching Networks and FS-4 Synthesizer see page 14

Push Button Encoding Mike see page 20

DRAKE MICROPHONES

Wired for use with Drake transmitters and transceivers, for either push-to-talk or VOX. Type of operation is determined by the VOX control setting of the transmitter.

Desk Type Model No. 7075

• **Type:** Heavy Duty Ceramic Desk Top • **Cable:** Four Foot, 3-Conductor, One Shield • **Output Level:** Minus 54 dB (0 dB = 1 volt/microbar) • **Frequency Reponse:** 80-7000 Hz • **Switching:** Adapts to either push-to-talk or VOX.

Hand-Held Type Model No. 7072

• **Type:** Ceramic, hand held • **Cable:** 11″ Retracted, 5′ extended, PVC 3 Cord, 1 shielded, Coil Cord • **Case:** Cycolac • **Finish:** Grey • **Output Level:** Minus 65 dB (0 dB = 1 volt/microbar) • **Frequency Response:** 300-3000 Hz • **Switching:** Adapts to either push-to-talk or VOX.

Stock No. 1411

Drake T-4XC

Solid State Linear permeability-tuned VFO with 1 kHz dial divisions. Gear driven dual circular dials. High mechanical, electrical and temperature stability.

Covers ham bands with crystals furnished. Covers all of 80, 40, 20 and 15 meters, and 28.5-29.0 MHz of 10 meters.

Covers 160 meters with accessory crystal. Four 500 kHz ranges in addition to the ham bands plus one fixed-frequency range can be switch-selected from the front panel.

Two 8-pole crystal lattice filters for sideband selection.

Transceives with the R-4, R-4A, R-4B, R-4C and SPR-4 Receivers. Switch on the T-4XC selects frequency control by receiver or transmitter PTO or independently. Illuminated dial shows which PTO is in use.

Usb, lsb, a-m and cw on all bands.

Controlled-carrier modulation for a-m is compatible with ssb linear amplifiers.

Automatic transmit-receive switching. Separate VOX time-delay adjustments for phone and cw. VOX gain is independent of microphone gain.

Choice of VOX or PTT. VOX can be disabled by front panel switch.

Adjustable pi network output.

Transmitting agc prevents flat-topping.

Meter reads relative output or plate current with switch on load control.

Built-in cw sidetone.

Spotting function for easy zero-beating.

Easily adaptable to RTTY, either fsk or afsk.

Compact size; rugged construction. Scratch resistant epoxy paint finish.

DRAKE T-4XC SPECIFICATIONS

• **Frequency Coverage:** 3.5-4.0 MHz, 7.0-7.5 MHz, 14.0-14.5 MHz, 21.0-21.5 MHz and 28.0-28.5 MHz with crystals supplied. Four accessory crystal sockets are provided for additional 500 kHz ranges between 1.8 and 30.0 MHz, excluding 2.3-3.0 MHz, 5.0-6.0 MHz and 11.0-12.0 MHz. Crystals for fixed-frequency operation may be plugged into a front-panel socket for use between 1.8 and 30.0 MHz, excluding 2.3-3.0 MHz, 5.0-6.0 MHz and 10.5-12.0 MHz. • **Dial Calibration:** Main dial is calibrated from 0 to 500 kHz in 1 kHz increments. Calibration Accuracy: Better than 1 kHz when calibrated to the nearest 100 kHz point. • **Stability:** Less than 100 Hz after warm up. Less than 100 Hz with 10% change in line voltage. • **Modes of Operation: Ssb:** Upper or lower sideband on all bands. VOX or Push-to-talk. • **Cw:** Grid-block keying. VOX circuit is keyed for automatic transmit-receive switching. Sidetone oscillator is keyed for monitoring. Shifted carrier system has no spurious outputs. • **A-m:** Controlled-carrier a-m modulation system is built in. This system is compatible with ssb linear amplifiers. VOX or push-to-talk. • **RTTY:** Two methods of RTTY are available. **1.** The VFO is easily adaptable to fsk. Signal frequency shifts the same direction on all bands and the same amount on any band with a given dial setting. **2.** The RTTY signal also may be generated by applying undistorted audio tones at the mike input in the ssb mode. A jack is provided at the rear panel to shift the carrier oscillator frequency by an amount that, in the lsb position, the frequency bandpass through the sideband filter is shifted so that the tones of 2125 and 2975 Hz will pass with equal amplitude. • **Sideband Suppression:** 60 dB or better. Carrier Suppression: 60 dB or better. • **Average Distortion Products:** at least 30 dB down. • **Frequency Response:** 350 to 2750 Hz at 6 dB down. • **Input Power:** Ssb and a-m—200 watts PEP, cw—200 watts. • **Output Impedance:** Nominal 52 ohms adjustable with pi network. (SWR should be 2:1 or less). • **Microphone Input:** High impedance. • **Agc:** Operates on ssb to prevent flat-topping due to overdrive. • **Power Requirements:** (Provided by AC-3 and AC-4 power supplies). 650 volts dc at 200 mA average and 330 mA maximum with better than 10% regulation from 50 mA to 330 mA and maximum ripple of less than 1%. 250 volts dc at 120 mA with 10% regulation from 82 mA to 120 mA. This includes the effect of the 650 volt supply change if both voltages are obtained from the same transformer. Maximum ripple must be less than ¼%. Also −45 to −65 volts dc adjustable filtered bias into a 33 k ohm load, and 12.6 volts ac or dc at 3 amps. • **Dimensions:** 5.5″H x 10.8″W x 11.7″ cabinet depth, 12.8″ overall depth (14 x 27.3 x 31.4 cm). • **Weight:** 14.6 lbs (6.6 kg).

CONTROLS AND JACKS:

• **Front:** Main tuning, accessory crystal switch, mode switch, sideband selector, band switch, transceive switch, rf tune, microphone gain, plate tuning, plate loading control with relative output swtich, and fixed-frequency crystal socket. • **Rear:** Power connector, mute jack, receiver antenna jack, antenna connector, anti-VOX/sidetone jack, receiver injection jack, RTTY carrier oscillator shift jack, carrier oscillator output jack, PTO lamp jack, microphone jack, key jack, anti-VOX/sidetone gain control, VOX gain control, VOX delay control-cw, and VOX delay control-ssb a-m.

C-Line Accessories

Model No. 1511

Drake MS-4 Matching Speaker

(Shown on facing page) for use with R-4, R-4A, R-4B and R-4C Receivers. (Has space to house AC-3 and AC-4 Power Supplies).

Power Supplies for T-4, T-4X, T-4XB or T-4XC (The AC-4 can be housed in an MS-4 speaker cabinet).

Model No. 1501 Drake AC-4
Model No. 1505 Drake DC-4

Accessory Bandwidth Filters available: Model No. 7011 Drake FL250, Model No. 7013 Drake FL500, Model No. 7015 Drake FL1500, Model No. 7017 Drake FL4000, Model No. 7019 Drake FL6000.

Linear Amplifier see page 15

RF Wattmeters see page 3

Matching Networks and FS-4 Synthesizer see page 14

Push Button Encoding Mike see page 20

DRAKE MICROPHONES

Wired for use with Drake transmitters and transceivers, for either push-to-talk or VOX. Type of operation is determined by the VOX control setting of the transmitter.

Desk Type Model No. 7075

• **Type:** Heavy Duty Ceramic Desk Top • **Cable:** Four Foot, 3-Conductor, One Shield • **Output Level:** Minus 54 dB (0 dB = 1 volt/microbar) • **Frequency Reponse:** 80-7000 Hz • **Switching:** Adapts to either push-to-talk or VOX.

Hand-Held Type Model No. 7072

• **Type:** Ceramic, hand held • **Cable:** 11″ Retracted, 5′ extended, PVC 3 Cord, 1 shielded, Coil Cord • **Case:** Cycolac • **Finish:** Grey • **Output Level:** Minus 65 dB (0 dB = 1 volt/microbar) • **Frequency Response:** 300-3000 Hz • **Switching:** Adapts to either push-to-talk or VOX.

DRAKE®

C-LINE ACCESSORIES

The new solid state Drake FS-4 Synthesizer opens the door to a new world of continuous-tuning short wave! Combines synthesized general coverage flexibility with the selectivity, stability, frequency readout and reliability of the Drake R-4C or SPR-4 Receivers.

Model No. 1520

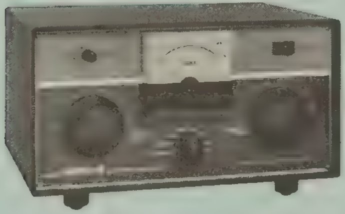
Drake FS-4 Digital Synthesizer

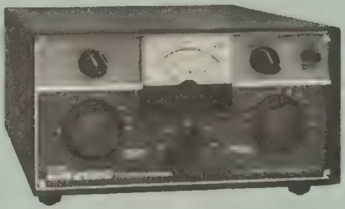
• Interfaces with all R-4 series receivers and T-4X series transmitters: (R-4, R-4A, R-4B, R-4C, SPR-4, T-4, T-4X, T-4XB and T-4XC), without modification. • MHz range is set on FS-4, with kHz readout taken from receiver dial. • Complete general coverage—no range crystals to buy. • T-4/T-4X series transmitters transceive on any FS-4 frequency, when used with R-4 series receivers. • Readout 1 kHz with Drake PTO.

R-4C/FS-4: • Passband Tuning, Notch Filter, optional Selectable 8-pole Crystal Filter for optimum selectivity. • Continuous coverage 1.5 MHz through 30 MHz.

SPR-4/FS-4: • All solid state • Built-in L/C Filter for selectivity on am, cw, usb and lsb. • Versatile combination includes low frequency Marine and Broadcast band. • Continuous coverage 150 kHz-30 MHz. • For use with SPR-4, order Interface Kit Model 1523.

Drake MN-4 & MN-2000 Matching Networks


MN-4 (Model No. 1507)


MN-2000 (Model No. 1509)

A Drake matching network is a worthwhile addition to any amateur station where peak performance is desired. Basically identical, except for power handling capabilities, the MN-4 and MN-2000 enable feedline SWR's of 5:1 to be matched to the transmitter. If input impedance is purely resistive, even higher SWR's can be handled. • Besides presenting a 50 ohm load to the transmitter, the Matching Network's built in rf wattmeter allows accurate and continuous power measurement and VSWR indication. The advanced wattmeter circuitry yields frequency-insensitive readings from 2 to 30 MHz, and accuracy until now obtainable only in expensive wattmeters.

DRAKE MN-4 & MN-2000 SPECIFICATIONS

Frequency Coverage:	3.5 to 4.0 MHz, 7.0 to 7.3 MHz, 14.0 to 14.35 MHz, 21.0 to 21.45 MHz, 28.0 to 29.7 MHz	
Input Impedance:	50 ohms (resistive)	
Load Impedance:	50 ohm coax with VSWR of 5:1 or less (any impedance angle) 75 ohm coax at a lower VSWR can be used.	
Meter:	Reads forward power in watts, or VSWR.	
Insertion Loss:	0.5 dB or less on each band after tuning	
	MN-4	**MN-2000**
Power Capability:	200 watts rf continuous	1000 watts rf average continuous duty, 2000 watts PEP
Wattmeter Accuracy:	± (5% of reading + 1% of full scale)	
Dimensions: (including connectors)[2]	5.5″H x 10.8″W x 8.5″D (14 x 27.3 x 21.6 cm)	5.5″H x 10.8″W x 14.4″D (14 x 27.3 x 36.5 cm)
Shipping: Weight: Dimensions:	9 lbs (4.1 kg) 11.8″ x 8″ x 10.3″ (29.8 x 20.3 x 26 cm)	18 lbs (8.2 kg) 18″ x 9″ x 15″ (45.7 x 22.9 x 38.1 cm)
FRONT PANEL CONTROLS	Resistive Tuning, Reactive Tuning, VSWR Calibration, Bandswitch, Watts/VSWR Selector Switch	
	—	Antenna/Dummy Load Switch
REAR PANEL	Ground Post and three SO-239 Connectors: one input, two outputs	Ground Post and four SO-239 connectors: One input, two outputs, one Alternate Antenna/Dummy Load

(Other C-Line Accessories: see page 11.)

Model No. 1519

Drake L-4B Linear Amplifier

• **2000 watts PEP ssb—1000 watts dc input power on cw, a-m, and RTTY.** Massive plate transformer, large heavy duty plate tank components and voluminous cooling system insure continuous operation at these ratings. • **High-efficiency Class B Grounded Grid Circuit** uses the new Eimac 3-500Z zero bias triodes. These tubes have a total plate dissipation rating of 1000 watts and their rugged construction withstands abuse. • **A broadband tuned input circuit** is employed on each band for minimum distortion, higher efficiency and a 50 ohm input impedance. • **Vernier Drive** on the plate tuning control for easy plate tuning. • **New Epoxy Finish** and eye-ease front panel. • **The L-4B Linear Amplifier matches TR-4 series transceivers and T-4 and T-4X series transmitters** in appearance and drive requirements to run the maximum legal input power. Any exciter that can deliver 100 watts PEP ssb and 75 watts on cw will be able to drive the L4B to the maximum legal input power. An advantage of the grounded grid circuit is that most of the driving power adds to the output power. • **Two taut-band suspension meters** indicate plate current, grid current, plate voltage, forward and reflected r-f power. The plate current meter time constant is consistant with FCC regulations. • **A transmitting agc circuit** controls the exciter gain to allow the highest average power without peak clipping. A front panel adjustment is provided to set the threshold level for optimum operation of different exciters. • **A standby switch** on the L4B allows the L4B to remain "On" while operating with the exciter only. • **Rf negative feedback** decreases distortion to better than 35 dB and tends to equalize tube characteristics from tube to tube and from brand to brand. • **Built-in rf directional wattmeter** calibrated 300 and 3000 watts forward and 300 watts reflected. • **An internal changeover relay** feeds the antenna through when on "Receive", "Standby", or when power is off. A pair of relay contacts bias the output tubes to cutoff, eliminating unwanted heat and diode noise when receiving. • **A quiet, internal blower**—low velocity, high volume. Effectively cools tube base seals, envelopes, and plate seals.

• **L-4B includes tubes, chimneys and a solid state power supply** which provides excellent dynamic and static voltage regulation. The power supply is separate to keep the weight off the operating desk and to make a more flexible installation.

DRAKE L-4B SPECIFICATIONS

• **Frequency Coverage**—Ham bands 80 through 10 meters. All frequencies 3.5 to 30 MHz may be covered with alteration of input coils. • **Plate Input**—2000 watts PEP—ssb, 1000 watts dc on cw, a-m and RTTY. • **Drive Requirements**—100 watts PEP—ssb, 75 watts cw, a-m and RTTY. • **Input Impedance**—50 ohms. • **Output Impedance**—Adjustable pi-network matches 50 ohm line with SWR not to exceed 2:1. • **Wattmeter Accuracy**—300 watts forward and reflected, ± (5% of reading + 3 watts). 3000 watts forward, ± (5% of reading + 30 watts). • **Power Requirements**—230 volts 50—60 cycles 15 amperes, or 115 volts 50—60 cycles 30 amperes. • **Dimensions—Amplifier** 14"W x 7.9"H x 14.4"D (35.4 x 20 x 36.4 cm), **Power Supply** 6.8"W x 7.9"H x 11"D (17.1 x 20 x 27.9 cm). • **Weight—Amplifier** 32 lbs (14.5 kg), **Power Supply** 43 lbs (19.5 kg). • **Tube Complement**—Two 3-500Z (Two 8163 or Two 3-400Z can be used). • **Shipping Wt & Size: Power Supply** 48 lbs (21 kg), 11.5" x 11" x 13.5" (29.2 x 27.9 x 34.3 cm); **Amplifier** 42 lbs (19.1 kg), 21" x 12" x 17" (53.3 x 30.5 x 43.2 cm).

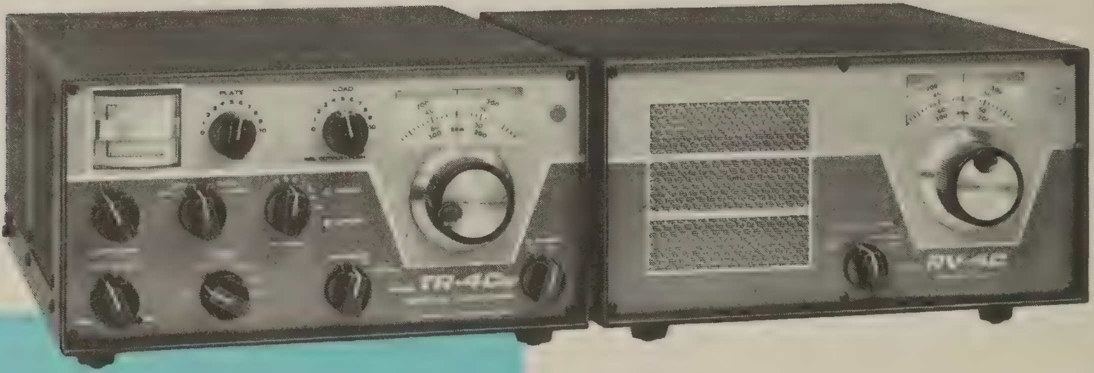
FRONT PANEL CONTROLS

• **On-Off**—Rocker Switch. • **Ssb-Cw/Tune**—Rocker switch changes plate voltage for different modes of operation. • **Band**—Switch selects desired ham bands (See Frequency Coverage). • **Plate and Load**—Tuning adjust pi-network capacitors in tank circuit for proper resonance and loading on all bands. • **Meter**—Switch selects monitoring either grid current, plate voltage, forward or reflected rf power on the lower meter. • **Alc/Standby Push**—Transmitting agc threshold adjustment and push-pull switch that allows the L-4B to remain on while operating with the exciter only. • **Rear Jacks**—Power (connects L-4B to power supply), high voltage, VOX (for turning on L-4B with exciter VOX contacts), transmitting agc (for connecting transmitting agc to exciter), rf input (for connecting to exciter rf output), rf output (for connecting L-4B to an antenna). • **Meters**—Plate Current, Grid Current/Plate Voltage/Forward Power/Reflected Power (switch selected). • **Power Supply Controls**—Two circuit breaker reset buttons.

Model No.
1317

Drake TR-4Cw Sideband/Cw Transceiver

with Model No. 1319 Drake RV-4C Remote VFO



The Transceiver for All License Classes

- 500 Hz cw filter now included
- Ideal for the licensee in the up-graded Novice/Technician Class.
- Runs the full 250 watt cw input.
- 80 thru 10 meters
- 1 kHz dual concentric dial
- Excellent PTO stability
- Full gating noise blanker optional
- Transceive or separate PTO
- Wide range receiving agc
- Calibration constant mode to mode
- 300 watts PEP input on ssb
- Shifted-carrier cw
- Upper and lower sideband
- Superb receiver overload and Cross-Mod characteristics
- VOX or PTT
- Output impedance adjustable

The many years of transceiver experience and design improvements behind the Drake TR-4Cw make it one of the finest transceivers available in both circuit design and packaging. Compact and lightweight, it is ideal for mobile use, portable excursions, and vacations. Usb, lsb, cw, or a-m operations is at your finger tips.

• **300 Watts PEP** input on ssb, 260 watts input on cw. • **Complete Amateur Band Frequency Coverage:** 80 through 15 meter bands complete and 28.5-29.1 MHz of 10 meters. Rest of 10 meter band obtained with accessory crystals. • **Separate Sideband Filters:** Separate usb and lsb filters eliminate oscillator shifting and insure long term carrier vs filter alignment. • **Nominal 1.7:1 Filter Shape Factor:** These filters stand among the industry's finest with 6dB bandwidth of 2.1 kHz (chosen to slice thru QRM), 60 dB bandwidth of only 3.6 kHz and 100 dB ultimate rejection. • **Provision For Highly Effective Accessory Noise Blanker.** • **Heavy Irridited Cadmium Plated Chassis.** • **Cw Side Tone Oscillator** for monitoring your cw transmission. • **Finish:** Scratch resistant epoxy paint. • **Crystal Calibrator** built in. • **VFO Indicator Light** eliminates confusion of which main tuning knob controls the frequency when using an RV-4C remote VFO. • **Automatic Cw Transmit Receive Switching** sometimes called "semi" break-in. • **Full Agc** with Drake dual time constant system confines a 60 dB signal change to a 3 dB audio change. • **Effective Transmitting Agc** insures clean ssb output. • **Solid State Permeability Tuned VFO** for low drift and accurate 1 kHz divisions on all bands. New easy to read dual concentric dials. • **VOX or PTT** for use on a-m or ssb. • **Receiver S-Meter** automatically switches to indicate transmitting agc on transmit. • **Transmitter Plate Ammeter** indicates **Relative Rf Output** by depressing load control shaft. • **Adjustable Pi-Network** output circuit.

DRAKE TR-4Cw SPECIFICATIONS

• **Frequency Coverage:** Full coverage on all amateur bands 10 thru 80 meters, in seven 600 kHz ranges, with crystals supplied: 3.5 to 4.1 MHz, 7.0 to 7.6 MHz, 13.9 to 14.5 MHz, 21.6 MHz, 28.5 to 29.1 MHz. Accessory crystals available for 28-28.6 and 29.1-29.7 ranges. • **Solid State VFO:** Has linear permeability tuning. Tunes 4.9 to 5.5 MHz for all ranges. • **Dial Calibration:** New concentric dials. 100 kHz markings on one dial, 1 kHz division on second dial. • **Frequency Stability:** High stability solid state VFO tunes same range on all bands. Drift is less than 100 Hz after warm-up, and less than 100 Hz for plus or minus 10% line voltage change. • **Modes of Operation:** Ssb upper and lower sideband, cw and a-m. • **Power Supply Requirements:** Due to the 300 watt, PEP input rating, the TR-4Cw requires a power supply capable of low voltage at high current with very good dynamic regulation. The voltage and current requirements are as follows: 1. 650 volts at 300 mA average and 500 mA maximum with 10% regulation from 100 mA to 500 mA and maximum ripple of less than 1%. 2. 250 volts at 175 mA with 10% regulation from 150 mA to 180 mA. This includes the effect of the 650 volt supply change if both voltages are obtained from the same transformer. Maximum ripple must be less than ¼%. 3. −45 to −65 V-dc adjustable filtered bias into 33K ohm load. 4. 12.6 volt ac or dc at 5.5 amps. • **Misc:** 20 tubes including voltage regulator; two transistors; 8 diodes; 100 kHz crystal calibrator built in; **Dimensions:** 5.5″H x 10.8″W x 14.4″D (13.9 x 27.3 x 36.5 cm). **Weight:** 16 lbs (35.2 kg). **Shipping:** Dimensions; 18″ x 9″ x 15″ (45.7 x 22.9 x 38.1 cm). Weight; 21 lbs (46.2 kg).

TRANSMITTER SPECIFICATIONS:

• **Single Sideband.** 300 watts PEP input power, VOX or PTT. Two special 9 MHz crystal filters provide upper or lower sideband selection on any band, without the necessity of shifting oscillators. Unwanted sideband suppression of more than 60 dB and carrier suppression of 60 dB. Overall audio frequency response 400 to 2500 hertz at 6 dB down. Distortion products 30 dB down from maximum output. • **Cw: Power input 260 watts.** Carrier is shifted approximately 1000 hertz into one sideband, and mixer and driver are keyed. Grid block keying is free from chirps and clicks. Automatic transmit/receive switching when key is operated. Cw sidetone oscillator for monitoring. • **A-m:** Controlled carrier a-m screen modulator is built-in. 260 watts PEP input. Low carrier power increases 6 times to 50 watts output at maximum modulation. This system is compatible with ssb linears. VOX or PTT. A diode envelope detector is used in this mode. Product Detector can be used by switching manually. • **Output Impedance:** Nominal 50 ohms, adjustable with pi-network. • **Microphone Input:** High-impedance.

RECEIVER SPECIFICATIONS:

• **Sensitivity:** Less than ½ microvolt for 10 dB S/N. • **I-f Selectivity:** 2.1 kHz at 6 dB, 3.6 kHz at 60 dB or 500 Hz at 6 dB for cw reception. • **Agc:** Full agc on received modes—audio output varies less than 3 dB for 60 dB change in signal level. Any amount of agc from zero to full can be obtained by adjustment of rf gain control. Time proven Drake agc system provides fast attack and slow release with noise pulse suppression, no pumping or popping evident. • **Antenna Input:** Nominal 50 ohms. • **Audio Response:** 400 to 2500 Hz at 6 dB. • **Audio Output Power:** 3 watts. • **Impedance:** 4 ohms.

CONTROLS

• **Front Panel Controls: "Main Tuning"** has spinner knob with adjustable skirt for calibrating main dial. Tunes VFO and rotates main dial. **"RF Tune"** tunes the rf circuits common to receiver rf amplifier and transmitter driver stages. 0-10 scale. **"Plate" and "Load"** tuning adjust pi-network capacitors in transmitter for proper resonance and loading on each band. Load control also converts ammeter to relative output when pushed in. **"Band"** switch selects desired ham band (see frequency coverage). **"Function"** switch has four positions "CAL, SSB, CW, AM." "CAL" operates built-in 100 kHz crystal calibrator for accurate setting of main tuning hair line indicator and knob skirt. "SSB" provides ssb operation, either VOX or PTT. "CW" provides for cw operation with automatic transmit receive switching and cw sidetone, and is used for tune up. "AM" provides for a-m operation with VOX or PTT, and with diode detector for receiving. **"Xmtr Gain"** functions as mike audio gain on ssb and a-m, and as carrier injection control on cw for tune and cw. **"Rcvr Gain"** knob controls receiver af gain and power ON-OFF switch. Lever behind knob controls setting of rf gain. **"Sideband"** switch in conjunction with indicator lights marked **"Upper"** and **"Lower"** selects desired sideband by connecting into the circuit either the upper or lower sideband filter, or cw filter • **Right Side Screwdriver Adjust Controls:** Vox Gain, Anti-Vox Gain, S-Meter Zero. • **Right Side Jacks:** Headphone (disconnects speaker circuit), Microphone (3-circuit for PTT), Key (normally closed). • **Rear Controls:** Sidetone gain, Dial light dimmer. • **Rear Jacks:** Power (connects TR-4Cw to power supply and speaker), MUTE (for muting an external receiver), EXT RCV (for connecting an external receiver to the antenna), Antenna (for connecting the TR-4 to the antenna). • **Left Side Controls**—Transceive/External receive switch (for selecting between the use of the TR-4Cw or an external receiver.) • **Inside Controls:** Carrier balance. • **Meters:** Receiver S-meter/transmitting agc indicator and plate ammeter/relative rf output indicator.

TR-4Cw ACCESSORIES

Model No. 1319 **Drake RV-4C Remote VFO** consists of a highly stable permeability-tuned solid-state VFO, a cathode follower, control circuitry and a 5-inch 4 ohm speaker. For use with TR-3 and TR-4 series transceivers, it permits reception, transmission, or both on a frequency different from the VFO setting of the transceiver, but in the same band to which the transceiver is tuned. • **Two Controls:** Main Tuning and RV-4C Function. • The RV-4C cabinet matches the transceiver and will house an AC-4 (or AC-3) power supply. • **Size:** 5.4″H x 10.8″W x 11.2″D (13.7 x 27.3 x 28.3 cm). **Weighs:** 6.5 lbs (3 kg).

Model No. 1315 **Drake FF-1 Fixed Frequency Adapter** allows crystal control operation on Receive or Transmit or both with up to two channels.

Model No. 1501 **Drake AC-4 Power Supply,** for use with all Drake 3 or 4 series transceivers and transmitters, supplies all the required voltages with the proper filtering and regulation and may be operated from 120 or 240 volts ac, 50 of 60 Hz. Fits inside the Model MS-4 Matching Speaker or the Remote VFO unit. • **SPECIFICATIONS: Input:** 120 or 240 volts ac 50/60 Hz. • **Output:** 650 volts dc at 300 mA average (500 mA peak). 250 volts dc at 175 mA. −45 to −65 volts dc adjustable bias into 33 K ohms. 12.6 volts ac at 5.5 amperes. • **Size:** 5″H x 10″W x 4.8″D (12.7 x 25.4 x 12 cm). • **Weight:** 17.2 lbs (7.8 kg).

Model No. 1505 **Drake DC-4 Power Supply** 12 V-dc Solid State for Drake 3 and 4-series transceivers.

Model No. 1511 **Drake MS-4 Matching Speaker** (details page 11).

DRAKE® Amateur VHF FM Transceiver

Model No. 6333

Drake TR-33C

- **SCPC* Frequency Control**
- **Lower Receiver Battery Drain**
- **Expanded Portable Antenna Choice**

**Single Crystal Per Channel*

• 12 Channels—only one crystal per channel provides simplex OR repeater operation on ANY channel. 2 channels supplied. 5 transmit offset positions, 3 supplied. • All FET front-end crystal filter for superb receiver intermod rejection. • Small convenient microphone included. • New lower power drain circuit on squelched receive. • Nicad rechargeable batteries supplied. • Built-in battery charger. • Ac and dc power cords supplied. • Telescoping screw-on antenna supplied, rubber helix optional. • Channel indicator light when using external dc supply. • Carry strap supplied. • Meter Indicates receive strength, xmit output, or battery voltage. • External speaker jack on rear panel. • Auxiliary jack on rear panel—may be used for tone-pad connections, etc. • Traditional R.L. Drake service backup.

ACCESSORIES

- **Model AA-10 Power Amplifier.**
- **Model AC-10 Power Supply.**
- **Accessory Crystals.**
- **Model MMK-33 Mobile Mount.**

DRAKE TR-33C SPECIFICATION'S

GENERAL: • **Frequency Coverage:** 146-148 MHz, 12 channels (2 supplied: 146.52 and 146.94). Crystal determines receive frequency. • Transmit frequency offset for repeater operation determined by 5-position switch: Simplex, +600 kHz, and −600 kHz supplied; any two additional offsets available with accessory crystals. • **Power requirements:** 13.0 volts dc ± 15% external supply OR internal battery supply. • **Current Drain (Batteries):** Squelched receive: 30 mA; transmit: 400 mA. External supply: above plus 45 mA for channel switch indicator lamp. • **Antenna:** 50 ohm external antenna through SO-239 connector OR screw-on telescoping whip antenna supplied, may be replaced with rubber helix antenna. • **Dimensions:** 5.5″ x 2.8″ x 8.5″ (13.8 x 5.8 x 21.6 cm). • **Weight:** 4.4 lbs (2 kg).

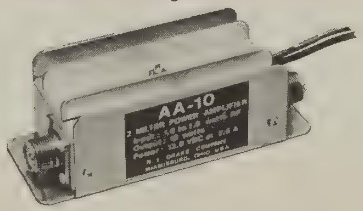
RECEIVER: • **Sensitivity:** less than .5 μV for 20 dB noise quieting. • **Selectivity:** ± 30 kHz adjacent channel rejection greater than 75 dB. • **Modulation acceptance:** at least ± 7 kHz. • **Inter modulation Rejection:** 70 dB referenced to sensitivity level. • **First i-f:** 10.7 MHz with monolithic crystal filter. • **Second i-f:** 455 kHz with ceramic filter. • **Audio Output:** nominal 1 watt at less than 10% distortion into 8 ohm built-in speaker or external speaker.

TRANSMITTER: • **Rf Output Power:** 1.5 watts nominal, with 13.0 volts dc supply. • **Frequency Deviation:** Direct frequency modulation adjustable to at least ± 7 kHz deviation, factory set at ± 5 kHz. • Separate microphone gain and deviation adjustments.

Model No. 1321

Drake AA-10 Power Amplifier

10 dB power increase greatly adds to the transmitting distance covered by and 2-meter fm transceiver running up to 1.8 watts output



Small size: 2″H x 2.1″W x 5.5″D (51 x 52 x 140 mm)

• Single stage solid-state balanced emitter vhf power transistor with VSWR protection. • Has no relays—automatic transmit/receive switching.

SPECIFICATIONS: • **Frequency Coverage:** 144-148 MHz. • **Rf Output Power:** 10 watts minimum at 13.8 volts dc and rated input power. • **Rf Input Power:** 1 watt nominal, 1.8 watt maximum. • **Receive Loss:** Fraction of 1 dB—unnoticeable. • **Connectors:** Type SO-239 Antenna and Transceiver Connectors. • **8 Semi-conductors.** • **Power Requirements:** 13.8 volts dc at 1.5 amperes.

[illegible]

Drake AC-10 Power Supply

Powers the AA-10, TR-22C, TR-33C and TR-72. Simultaneously can charge the TR-22C/33C nicads. Supplies 13.8 volts up to 3 amps from 120 V-ac 60 Hz input.

Drake Crystals

Fixed Frequency: Operation with:

T-4X* For operation below 10 MHz, Xtal.
T-4XB* Freq. = Oper. Freq. + 5.645.
T-4XC For operation above 10 MHz.
R-4A Xtal Freq. = $\frac{\text{Oper. Freq. } + 5.645}{2}$
R-4B

**Modified for fixed frequency operation*

Variable Frequency: Operation with:

T-4X
T-4XB
T-4XC Xtal Freq. = low end of Oper. Band. in MHz + 11.1.
R-4A
R-4B
R-4C

Crystals for:

TR-33C
Specify Transmit or Receive and Frequency

SPR-4 Crystals

Operating Frequency in MHz	Crystal Frequency in MHz	Operating Frequency in MHz	Crystal Frequency in MHz
.15 — .5*		15.0 — 15.5*	26.09
.5 — 1.0*	11.59	15.5 — 16.0	26.59
1.0 — 1.5*	12.09	16.0 — 16.5	27.09
1.5 — 2.0	12.59	16.5 — 17.0	27.59
2.0 — 2.5	13.09	17.0 — 17.5	28.09
2.5 — 3.0	13.59	17.5 — 18.0*	28.59
3.0 — 3.5	14.09	18.0 — 18.5	29.09
3.5 — 4.0	14.59	18.5 — 19.0	29.59
4.0 — 4.5	15.09	19.0 — 19.5	30.09
4.5 — 5.0	15.59	19.5 — 20.0	30.59
5.0 — 5.5	16.09	20.0 — 20.5	31.09
5.5 — 6.0	16.59	20.5 — 21.0	31.59
6.0 — 6.5*	17.09	21.0 — 21.5	32.09
6.5 — 7.0	17.59	21.5 — 22.0*	32.59
7.0 — 7.5*	18.09	22.0 — 22.5	33.09
7.5 — 8.0	18.59	22.5 — 23.0	33.59
8.0 — 8.5	19.09	23.0 — 23.5	34.09
8.5 — 9.0	19.59	23.5 — 24.0	34.59
9.0 — 9.5	20.09	24.0 — 24.5	35.09
9.5 — 10.0*	20.59	24.5 — 25.0	35.59
10.0 — 10.5	21.09	25.0 — 25.5	36.09
10.5 — 11.0	21.59	25.5 — 26.0	36.59
11.0 — 11.5	22.09	26.0 — 26.5	37.09
11.5 — 12.0*	22.59	26.5 — 27.0	37.59
12.0 — 12.5	23.09	27.0 — 27.5	38.09
12.5 — 13.0	23.59	27.5 — 28.0	38.59
13.0 — 13.5	24.09	28.0 — 28.5	39.09
13.5 — 14.0	24.59	28.5 — 29.0	39.59
14.0 — 14.5	25.09	29.0 — 29.5	40.09
14.5 — 15.0	25.59	29.5 — 30.0	40.59

*SPR—4 normally supplied with these operating frequencies.

Crystal Frequencies for Equipment Working through Repeaters

Drake stocks TR-33C cystals for the following frequencies which are normally available for immediate shipment. Crystals for other frequencies usually require approximately four weeks delivery.

Repeater Frequencies

Frequency in MHz	
Transmit†	**Receive**
146.01	146.61
146.04	146.64
146.07	146.67
146.10	146.70
146.13	146.73
146.16	146.76
146.19	146.79
146.22	146.82
146.25	146.85
146.28	146.88
146.31	146.91
146.34	146.94
146.37	146.97

Simplex Frequencies

Frequency in MHz	
Transmit†	**Receive**
146.40	146.40
146.43	146.43
146.46	146.46
146.49	146.49
146.52	146.52
146.55	146.55
146.58	146.58

NOTE: Orders for crystals outside the 2 Meter Band will not be accepted.

†Standard Repeater and Simplex frequencies. Separate Transmit Crystals are not needed for the TR-33C since it uses a single Crystal per channel and has built-in standard Transmit offsets. Special offsets available.

SPR-4 CRYSTAL KITS

Amateur Bands—160m, 80m, 20m, 15m and 10m ranges. Six crystals cover:

1.5 — 2.0 MHz
3.5 — 4.0
14.0 — 14.5
21.0 — 21.5 MHz
28.0 — 28.5
28.5 — 29.0

Marine Bands—Eleven crystals cover:

2.0 — 2.5 MHz
2.5 — 3.0
4.0 — 4.5
8.0 — 8.5
8.5 — 9.0 MHz
12.0 — 12.5
13.0 — 13.5
16.5 — 17.0
17.0 — 17.5 MHz
22.0 — 22.5
22.5 — 23.0

Aeronautical Overseas—Seven crystals cover:

2.5 — 3.0 MHz
3.0 — 3.5
4.5 — 5.0
5.5 — 6.0
6.5 — 7.0 MHz
8.5 — 9.0
13.0 — 13.5

Time & Frequency Standard, WWV—Five crystals cover:

2.5 — 3.0 MHz
5.0 — 5.5
10.0 — 10.5
15.0 — 15.5 MHz (orginal equipment)
20.0 — 20.5
25.0 — 25.5

Citizens Band—One crystal and Frequency chart:

27.0 — 27.5 MHz* (*Generous overtravel gives additional 50 kHz or more off ends of each range).

Tropical Broadcast—Three crystals cover:

2.0 — 2.5 MHz
3.0 — 3.5 MHz
4.5 — 5.0 MHz

MARS—Five crystals cover:

2.0 — 2.5 MHz
3.0 — 3.5
4.0 — 4.5 MHz
5.0 — 5.5
18.0 — 18.5 MHz

Teletype Commercial—UPI, AP, Stock Market, Weather, etc.—Four crystals cover:

7.5 — 8.0 MHz
9.0 — 9.5
13.5 — 14.0 MHz
15.5 — 16.0

Remote Coax Switch

Model No. 1518

Drake RCS-4

- **Remotely Selects One of Five Antennas**
- **Grounds All Unused Antennas**
- **Grounds All Antennas in Gnd Position for Lightning Protection**
- **Front Panel Indicator Monitors Antenna Selection Interval**
- **Protected Against Adverse Weather Conditions**
- **SO-239 Connectors Provided for Main Coax Feed-Line and Individual Antenna Feed-Lines**
- **Handles 2000 Watts PEP**
- **Available in 120 V-ac or 240 V-ac 50/60Hz Versions**

• Control unit works on 110/220 V-ac, 50/60 Hz, and supplies necessary voltage to motor. • Excellent for single coax feed to multiband quads or arrays of monobanders. The five positions allow a single coax feed to three beams and two dipoles, or other similar combinations. • Control cable (not supplied) same as for HAM-M rotator. • Selects antennas remotely, grounds all unused antennas. Gnd position grounds all antennas when leaving station. "Rain-Hat" construction shields motor and switches. • Up to 30 MHz, insertion of switch changes VSWR no more than 1.05:1. • From 30 MHz to 150 MHz, insertion changes VSWR no more than 1.5:1. • Motor: 24 V-ac, 2 amp. Lubrication good to −40°F. • Switch Rf Capability: Maximum legal limit.

Push Button Encoding Mike

Model No. 1525

Drake 1525EM

- Microphone and auto-patch encoder in single convenient package with coil cord and connector. Fully wired and ready for use.
- High accuracy IC tone generator, no frequency adjustments.
- High reliability Digitran® keyboard.
- Power for tone encoder obtained from transceiver through microphone cable. No battery required. Low current drain.
- Low output impedance allows use with almost all transceivers.
- Four pin microphone plug: directly connects to Drake TR-33C without any modification in transceiver. Compatible with all previous Drake and other 2 meter units with minor modifications.
- Tone level adjustable.
- Hang-up hook supplied.

SPECIFICATIONS:

• **Microphone Element Type:** Low impedance dynamic • **Frequency Response:** 300-5000 Hz • **Output Impedance:** 500 ohms • **Microphone Output Level:** −72 dBm per microbar. Approx 3mV (−47dBm) with average voice level • **Tone Encoder:** Single integrated circuit dual tone synthesizer • **Encoder Audio Level:** Adjustable from approx 1mV to 5mV with internal potentiometer • **Encoder Frequency Tolerance:** Better than ±1% from −20°C to +50°C • **Encoder Supply Voltage:** 7.5 to 15 Volts (Obtained through microphone cable from transceiver) • **Encoder Current Drain:** 5 to 20 mA depending on supply voltage • **Encoder Keyboard:** High reliability Digitran® keyboard • **Microphone Hanger:** Hook supplied • **Dimensions:** 2.6″ x 3.5″ x 1.7″ (6.6 x 8.9 x 4.3 cm) • **Weight:** 8 oz. (.227 kg)

Drake 1525EM, microphone with tone encoder and connector for TR-33C, TR-72, TR-22C, ML-2

Drake 7073DM as above but without tone encoder

R. L. DRAKE COMPANY DRAKE®

540 Richard St., Miamisburg, Ohio 45342
Phone: (513) 866-2421 • Telex: 288-017

Western Sales and Service Center, 2020 Western Street, Las Vegas, Nevada 89102 • 702/382-9470

LITHO IN U.S.A.

Model No. 1519

Drake L-4B Linear Amplifier

- **2000 watts PEP ssb—1000 watts dc input power on cw, a-m, and RTTY.** Massive plate transformer, large heavy duty plate tank components and voluminous cooling system insure continuous operation at these ratings. • **High-efficiency Class B Grounded Grid Circuit** uses the new Eimac 3-500Z zero bias triodes. These tubes have a total plate dissipation rating of 1000 watts and their rugged construction withstands abuse. • **A broadband tuned input circuit** is employed on each band for minimum distortion, higher efficiency and a 50 ohm input impedance. • **Vernier Drive** on the plate tuning control for easy plate tuning. • **New Epoxy Finish** and eye-ease front panel. • **The L-4B Linear Amplifier matches TR-4 series transceivers and T-4 and T-4X series transmitters** in appearance and drive requirements to run the maximum legal input power. Any exciter that can deliver 100 watts PEP ssb and 75 watts on cw will be able to drive the L4B to the maximum legal input power. An advantage of the grounded grid circuit is that most of the driving power adds to the output power. • **Two taut-band suspension meters** indicate plate current, grid current, plate voltage, forward and reflected r-f power. The plate current meter time constant is consistant with FCC regulations. • **A transmitting agc circuit** controls the exciter gain to allow the highest average power without peak clipping. A front panel adjustment is provided to set the threshold level for optimum operation of different exciters. • **A standby switch** on the L4B allows the L4B to remain "On" while operating with the exciter only. • **Rf negative feedback** decreases distortion to better than 35 dB and tends to equalize tube characteristics from tube to tube and from brand to brand. • **Built-in rf directional wattmeter** calibrated 300 and 3000 watts forward and 300 watts reflected. • **An internal changeover relay** feeds the antenna through when on "Receive", "Standby", or when power is off. A pair of relay contacts bias the output tubes to cutoff, eliminating unwanted heat and diode noise when receiving. • **A quiet, internal blower**—low velocity, high volume. Effectively cools tube base seals, envelopes, and plate seals.
- **L-4B includes tubes, chimneys and a solid state power supply** which provides excellent dynamic and static voltage regulation. The power supply is separate to keep the weight off the operating desk and to make a more flexible installation.

DRAKE L-4B SPECIFICATIONS

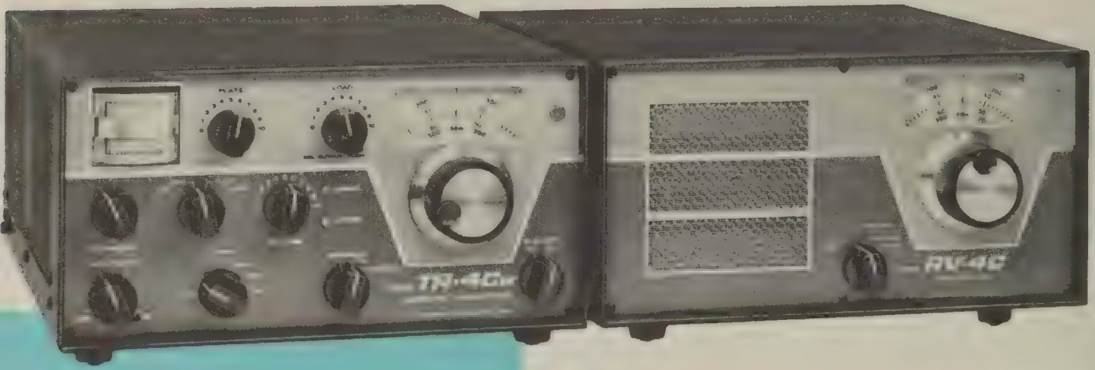
• **Frequency Coverage**—Ham bands 80 through 10 meters. All frequencies 3.5 to 30 MHz may be covered with alteration of input coils. • **Plate Input**—2000 watts PEP—ssb, 1000 watts dc on cw, a-m and RTTY. • **Drive Requirements**—100 watts PEP—ssb, 75 watts cw, a-m and RTTY. • **Input Impedance**—50 ohms. • **Output Impedance**—Adjustable pi-network matches 50 ohm line with SWR not to exceed 2:1. • **Wattmeter Accuracy**—300 watts forward and reflected, ± (5% of reading + 3 watts). 3000 watts forward, ± (5% of reading + 30 watts). • **Power Requirements**—230 volts 50—60 cycles 15 amperes, or 115 volts 50—60 cycles 30 amperes. • **Dimensions—Amplifier** 14″W x 7.9″H x 14.4″D (35.4 x 20 x 36.4 cm), **Power Supply** 6.8″W x 7.9″H x 11″D (17.1 x 20 x 27.9 cm). • **Weight—Amplifier** 32 lbs (14.5 kg), **Power Supply** 43 lbs (19.5 kg). • **Tube Complement**—Two 3-500Z (Two 8163 or Two 3-400Z can be used). • **Shipping Wt & Size: Power Supply** 48 lbs (21 kg), 11.5″ x 11″ x 13.5″ (29.2 x 27.9 x 34.3 cm); **Amplifier** 42 lbs (19.1 kg), 21″ x 12″ x 17″ (53.3 x 30.5 x 43.2 cm).

FRONT PANEL CONTROLS

• **On-Off**—Rocker Switch. • **Ssb-Cw/Tune**—Rocker switch changes plate voltage for different modes of operation. • **Band**—Switch selects desired ham bands (See Frequency Coverage). • **Plate and Load**—Tuning adjust pi-network capacitors in tank circuit for proper resonance and loading on all bands. • **Meter**—Switch selects monitoring either grid current, plate voltage, forward or reflected rf power on the lower meter. • **Alc/Standby Push**—Transmitting agc threshold adjustment and push-pull switch that allows the L-4B to remain on while operating with the exciter only. • **Rear Jacks**—Power (connects L-4B to power supply), high voltage, VOX (for turning on L-4B with exciter VOX contacts), transmitting agc (for connecting transmitting agc to exciter), rf input (for connecting to exciter rf output), rf output (for connecting L-4B to an antenna). • **Meters**—Plate Current, Grid Current/Plate Voltage/Forward Power/Reflected Power (switch selected). • **Power Supply Controls**—Two circuit breaker reset buttons.

Model No. 1311 Drake TR-4Cw Sideband/Cw Transceiver

with Model No. 1319 Drake RV-4C Remote VFO



The Transceiver for All License Classes

- **500 Hz cw filter now included**
- **Ideal for the licensee in the up-graded Novice/Technician Class.**
- **Runs the full 250 watt cw input.**
- **80 thru 10 meters**
- **1 kHz dual concentric dial**
- **Excellent PTO stability**
- **Full gating noise blanker optional**
- **Transceive or separate PTO**
- **Wide range receiving agc**
- **Calibration constant mode to mode**
- **300 watts PEP input on ssb**
- **Shifted-carrier cw**
- **Upper and lower sideband**
- **Superb receiver overload and Cross-Mod characteristics**
- **VOX or PTT**
- **Output impedance adjustable**

The many years of transceiver experience and design improvements behind the Drake TR-4Cw make it one of the finest transceivers available in both circuit design and packaging. Compact and lightweight, it is ideal for mobile use, portable excursions, and vacations. Usb, lsb, cw, or a-m operations is at your finger tips.

• **300 Watts PEP** input on ssb, 260 watts input on cw. • **Complete Amateur Band Frequency Coverage:** 80 through 15 meter bands complete and 28.5-29.1 MHz of 10 meters. Rest of 10 meter band obtained with accessory crystals. • **Separate Sideband Filters:** Separate usb and lsb filters eliminate oscillator shifting and insure long term carrier vs filter alignment. • **Nominal 1.7:1 Filter Shape Factor:** These filters stand among the industry's finest with 6dB bandwidth of 2.1 kHz (chosen to slice thru QRM), 60 dB bandwidth of only 3.6 kHz and 100 dB ultimate rejection. • **Provision For Highly Effective Accessory Noise Blanker.** • **Heavy Irridited Cadmium Plated Chassis.** • **Cw Side Tone Oscillator** for monitoring your cw transmission. • **Finish:** Scratch resistant epoxy paint. • **Crystal Calibrator** built in. • **VFO Indicator Light** eliminates confusion of which main tuning knob controls the frequency when using an RV-4C remote VFO. • **Automatic Cw Transmit Receive Switching** sometimes called "semi" break-in. • **Full Agc** with Drake dual time constant system confines a 60 dB signal change to a 3 dB audio change. • **Effective Transmitting Agc** insures clean ssb output. • **Solid State Permeability Tuned VFO** for low drift and accurate 1 kHz divisions on all bands. New easy to read dual concentric dials. • **VOX or PTT** for use on a-m or ssb. • **Receiver S-Meter** automatically switches to indicate transmitting agc on transmit. • **Transmitter Plate Ammeter** indicates **Relative Rf Output** by depressing load control shaft. • **Adjustable Pi-Network** output circuit.

DRAKE TR-4Cw SPECIFICATIONS

• **Frequency Coverage:** Full coverage on all amateur bands 10 thru 80 meters, in seven 600 kHz ranges, with crystals supplied: 3.5 to 4.1 MHz, 7.0 to 7.6 MHz, 13.9 to 14.5 MHz, 21.6 MHz, 28.5 to 29.1 MHz. Accessory crystals available for 28-28.6 and 29.1-29.7 ranges. • **Solid State VFO:** Has linear permeability tuning. Tunes 4.9 to 5.5 MHz for all ranges. • **Dial Calibration:** New concentric dials. 100 kHz markings on one dial, 1 kHz division on second dial. • **Frequency Stability:** High stability solid state VFO tunes same range on all bands. Drift is less than 100 Hz after warm-up, and less than 100 Hz for plus or minus 10% line voltage change. • **Modes of Operation:** Ssb upper and lower sideband, cw and a-m. • **Power Supply Requirements:** Due to the 300 watt, PEP input rating, the TR-4Cw requires a power supply capable of low voltage at high current with very good dynamic regulation. The voltage and current requirements are as follows: 1. 650 volts at 300 mA average and 500 mA maximum with 10% regulation from 100 mA to 500 mA and maximum ripple of less than 1%. 2. 250 volts at 175 mA with 10% regulation from 150 mA to 180 mA. This includes the effect of the 650 volt supply change if both voltages are obtained from the same transformer. Maximum ripple must be less than ¼%. 3. −45 to −65 V-dc adjustable filtered bias into 33K ohm load. 4. 12.6 volt ac or dc at 5.5 amps. • **Misc:** 20 tubes including voltage regulator; two transistors; 8 diodes; 100 kHz crystal calibrator built in; **Dimensions:** 5.5″H x 10.8″W x 14.4″D (13.9 x 27.3 x 36.5 cm). **Weight:** 16 lbs (35.2 kg). **Shipping:** Dimensions; 18″ x 9″ x 15″ (45.7 x 22.9 x 38.1 cm). Weight; 21 lbs (46.2 kg).

TRANSMITTER SPECIFICATIONS:

• **Single Sideband.** 300 watts PEP input power, VOX or PTT. Two special 9 MHz crystal filters provide upper or lower sideband selection on any band, without the necessity of shifting oscillators. Unwanted sideband suppression of more than 60 dB and carrier suppression of 60 dB. Overall audio frequency response 400 to 2500 hertz at 6 dB down. Distortion products 30 dB down from maximum output. • **Cw: Power input 260 watts.** Carrier is shifted approximately 1000 hertz into one sideband, and mixer and driver are keyed. Grid block keying is free from chirps and clicks. Automatic transmit/receive switching when key is operated. Cw sidetone oscillator for monitoring. • **A-m:** Controlled carrier a-m screen modulator is built-in. 260 watts PEP input. Low carrier power increases 6 times to 50 watts output at maximum modulation. This system is compatible with ssb linears. VOX or PTT. A diode envelope detector is used in this mode. Product Detector can be used by switching manually. • **Output Impedance:** Nominal 50 ohms, adjustable with pi-network. • **Microphone Input:** High-impedance.

RECEIVER SPECIFICATIONS:

• **Sensitivity:** Less than ½ microvolt for 10 dB S/N. • **I-f Selectivity:** 2.1 kHz at 6 dB, 3.6 kHz at 60 dB or 500 Hz at 6 dB for cw reception. • **Agc:** Full agc on received modes—audio output varies less than 3 dB for 60 dB change in signal level. Any amount of agc from zero to full can be obtained by adjustment of rf gain control. Time proven Drake agc system provides fast attack and slow release with noise pulse suppression, no pumping or popping evident. • **Antenna Input:** Nominal 50 ohms. • **Audio Response:** 400 to 2500 Hz at 6 dB. • **Audio Output Power:** 3 watts. • **Impedance:** 4 ohms.

CONTROLS

• **Front Panel Controls: "Main Tuning"** has spinner knob with adjustable skirt for calibrating main dial. Tunes VFO and rotates main dial. **"RF Tune"** tunes the rf circuits common to receiver rf amplifier and transmitter driver stages. 0-10 scale. **"Plate" and "Load"** tuning adjust pi-network capacitors in transmitter for proper resonance and loading on each band. Load control also converts ammeter to relative output when pushed in. **"Band"** switch selects desired ham band (see frequency coverage). **"Function"** switch has four positions "CAL, SSB, CW, AM." "CAL" operates built-in 100 kHz crystal calibrator for accurate setting of main tuning hair line indicator and knob skirt. "SSB" provides ssb operation, either VOX or PTT. "CW" provides for cw operation with automatic transmit receive switching and cw sidetone, and is used for tune up. "AM" provides for a-m operation with VOX or PTT, and with diode detector for receiving. **"Xmtr Gain"** functions as mike audio gain on ssb and a-m, and as carrier injection control on cw for tune and cw. **"Rcvr Gain"** knob controls receiver af gain and power ON-OFF switch. Lever behind knob controls setting of rf gain. **"Sideband"** switch in conjunction with indicator lights marked **"Upper"** and **"Lower"** selects desired sideband by connecting into the circuit either the upper or lower sideband filter, or cw filter • **Right Side Screwdriver Adjust Controls:** Vox Gain, Anti-Vox Gain, S-Meter Zero. • **Right Side Jacks:** Headphone (disconnects speaker circuit), Microphone (3-circuit for PTT), Key (normally closed). • **Rear Controls:** Sidetone gain, Dial light dimmer. • **Rear Jacks:** Power (connects TR-4Cw to power supply and speaker), MUTE (for muting an external receiver), EXT RCV (for connecting an external receiver to the antenna), Antenna (for connecting the TR-4 to the antenna). • **Left Side Controls**—Transceive/External receive switch (for selecting between the use of the TR-4Cw or an external receiver.) • **Inside Controls:** Carrier balance. • **Meters:** Receiver S-meter/transmitting agc indicator and plate ammeter/relative rf output indicator.

TR-4Cw ACCESSORIES

Model No. 1319 **Drake RV-4C Remote VFO** consists of a highly stable permeability-tuned solid-state VFO, a cathode follower, control circuitry and a 5-inch 4 ohm speaker. For use with TR-3 and TR-4 series transceivers, it permits reception, transmission, or both on a frequency different from the VFO setting of the transceiver, but in the same band to which the transceiver is tuned. • **Two Controls:** Main Tuning and RV-4C Function. • The RV-4C cabinet matches the transceiver and will house an AC-4 (or AC-3) power supply. • **Size:** 5.4″H x 10.8″W x 11.2″D (13.7 x 27.3 x 28.3 cm). **Weighs:** 6.5 lbs (3 kg).

Model No. 1315 **Drake FF-1 Fixed Frequency Adapter** allows crystal control operation on Receive or Transmit or both with up to two channels.

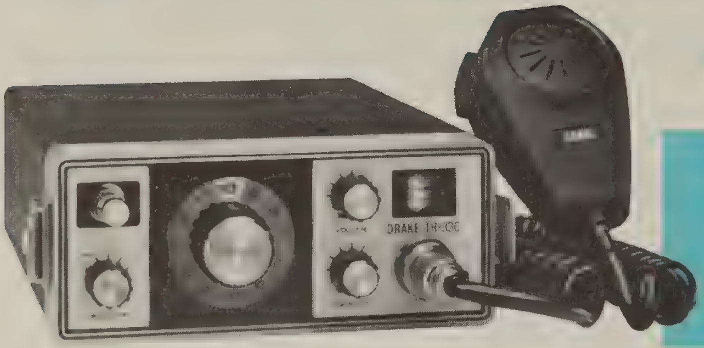
Model No. 1501 **Drake AC-4 Power Supply,** for use with all Drake 3 or 4 series transceivers and transmitters, supplies all the required voltages with the proper filtering and regulation and may be operated from 120 or 240 volts ac, 50 of 60 Hz. Fits inside the Model MS-4 Matching Speaker or the Remote VFO unit. • **SPECIFICATIONS: Input:** 120 or 240 volts ac 50/60 Hz. • **Output:** 650 volts dc at 300 mA average (500 mA peak). 250 volts dc at 175 mA. −45 to −65 volts dc adjustable bias into 33 K ohms. 12.6 volts ac at 5.5 amperes. • **Size:** 5″H x 10″W x 4.8″D (12.7 x 25.4 x 12 cm). • **Weight:** 17.2 lbs (7.8 kg).

Model No. 1505 **Drake DC-4 Power Supply** 12 V-dc Solid State for Drake 3 and 4-series transceivers.

Model No. 1511 **Drake MS-4 Matching Speaker** (details page 11).

DRAKE®

Amateur VHF FM Transceiver



Model No. 8333

Drake TR-33C

- SCPC* Frequency Control
- Lower Receiver Battery Drain
- Expanded Portable Antenna Choice

**Single Crystal Per Channel*

• 12 Channels—only one crystal per channel provides simplex OR repeater operation on ANY channel. 2 channels supplied. 5 transmit offset positions, 3 supplied. • All FET front-end crystal filter for superb receiver intermod rejection. • Small convenient microphone included. • New lower power drain circuit on squelched receive. • Nicad rechargeable batteries supplied. • Built-in battery charger. • Ac and dc power cords supplied. • Telescoping screw-on antenna supplied, rubber helix optional. • Channel indicator light when using external dc supply. • Carry strap supplied. • Meter Indicates receive strength, xmit output, or battery voltage. • External speaker jack on rear panel. • Auxiliary jack on rear panel—may be used for tone-pad connections, etc. • Traditional R.L. Drake service backup.

ACCESSORIES

- **Model AA-10 Power Amplifier.**
- **Model AC-10 Power Supply.**
- **Accessory Crystals.**
- **Model MMK-33 Mobile Mount.**

DRAKE TR-33C SPECIFICATION'S

GENERAL: • **Frequency Coverage:** 146-148 MHz, 12 channels (2 supplied: 146.52 and 146.94). Crystal determines receive frequency. • Transmit frequency offset for repeater operation determined by 5-position switch: Simplex, +600 kHz, and −600 kHz supplied; any two additional offsets available with accessory crystals. • **Power requirements:** 13.0 volts dc ± 15% external supply OR internal battery supply. • **Current Drain (Batteries):** Squelched receive: 30 mA; transmit: 400 mA. External supply: above plus 45 mA for channel switch indicator lamp. • **Antenna:** 50 ohm external antenna through SO-239 connector OR screw-on telescoping whip antenna supplied, may be replaced with rubber helix antenna. • **Dimensions:** 5.5″ x 2.8″ x 8.5″ (13.8 x 5.8 x 21.6 cm). • **Weight:** 4.4 lbs (2 kg).

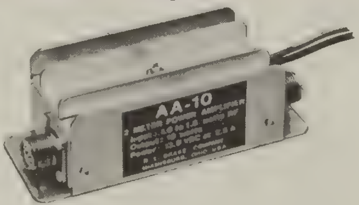
RECEIVER: • **Sensitivity:** less than .5 μV for 20 dB noise quieting. • **Selectivity:** ± 30 kHz adjacent channel rejection greater than 75 dB. • **Modulation acceptance:** at least ± 7 kHz. • **Inter modulation Rejection:** 70 dB referenced to sensitivity level. • **First i-f:** 10.7 MHz with monolithic crystal filter. • **Second i-f:** 455 kHz with ceramic filter. • **Audio Output:** nominal 1 watt at less than 10% distortion into 8 ohm built-in speaker or external speaker.

TRANSMITTER: • **Rf Output Power:** 1.5 watts nominal, with 13.0 volts dc supply. • **Frequency Deviation:** Direct frequency modulation adjustable to at least ± 7 kHz deviation, factory set at ± 5 kHz. • Separate microphone gain and deviation adjustments.

Model No. 1321

Drake AA-10 Power Amplifier

10 dB power increase greatly adds to the transmitting distance covered by and 2-meter fm transceiver running up to 1.8 watts output



Small size: 2″H x 2.1″W x 5.5″D (51 x 52 x 140 mm)

• Single stage solid-state balanced emitter vhf power transistor with VSWR protection. • Has no relays—automatic transmit/receive switching.

SPECIFICATIONS: • **Frequency Coverage:** 144-148 MHz. • **Rf Output Power:** 10 watts minimum at 13.8 volts dc and rated input power. • **Rf Input Power:** 1 watt nominal, 1.8 watt maximum. • **Receive Loss:** Fraction of 1 dB—unnoticeable. • **Connectors:** Type SO-239 Antenna and Transceiver Connectors. • **8 Semi-conductors.** • **Power Requirements:** 13.8 volts dc at 1.5 amperes.

[illegible]

Drake AC-10 Power Supply

Powers the AA-10, TR-22C, TR-33C and TR-72. Simultaneously can charge the TR-22C/33C nicads. Supplies 13.8 volts up to 3 amps from 120 V-ac 60 Hz input.

Drake Crystals

Fixed Frequency: Operation with:

T-4X* For operation below 10 MHz, Xtal.
T-4XB* Freq. = Oper. Freq. + 5.645.
T-4XC For operation above 10 MHz.
R-4A $\text{Xtal Freq.} = \frac{\text{Oper. Freq.} + 5.645}{2}$
R-4B

**Modified for fixed frequency operation*

Variable Frequency: Operation with:

T-4X
T-4XB
T-4XC Xtal Freq. = low end of Oper. Band. in MHz + 11.1.
R-4A
R-4B
R-4C

Crystals for:

TR-33C
Specify Transmit or Receive and Frequency

SPR-4 Crystals

Operating Frequency in MHz	Crystal Frequency in MHz	Operating Frequency in MHz	Crystal Frequency in MHz
.15 — .5*		15.0 — 15.5*	26.09
.5 — 1.0*	11.59	15.5 — 16.0	26.59
1.0 — 1.5*	12.09	16.0 — 16.5	27.09
1.5 — 2.0	12.59	16.5 — 17.0	27.59
2.0 — 2.5	13.09	17.0 — 17.5	28.09
2.5 — 3.0	13.59	17.5 — 18.0*	28.59
3.0 — 3.5	14.09	18.0 — 18.5	29.09
3.5 — 4.0	14.59	18.5 — 19.0	29.59
4.0 — 4.5	15.09	19.0 — 19.5	30.09
4.5 — 5.0	15.59	19.5 — 20.0	30.59
5.0 — 5.5	16.09	20.0 — 20.5	31.09
5.5 — 6.0	16.59	20.5 — 21.0	31.59
6.0 — 6.5*	17.09	21.0 — 21.5	32.09
6.5 — 7.0	17.59	21.5 — 22.0*	32.59
7.0 — 7.5*	18.09	22.0 — 22.5	33.09
7.5 — 8.0	18.59	22.5 — 23.0	33.59
8.0 — 8.5	19.09	23.0 — 23.5	34.09
8.5 — 9.0	19.59	23.5 — 24.0	34.59
9.0 — 9.5	20.09	24.0 — 24.5	35.09
9.5 — 10.0*	20.59	24.5 — 25.0	35.59
10.0 — 10.5	21.09	25.0 — 25.5	36.09
10.5 — 11.0	21.59	25.5 — 26.0	36.59
11.0 — 11.5	22.09	26.0 — 26.5	37.09
11.5 — 12.0*	22.59	26.5 — 27.0	37.59
12.0 — 12.5	23.09	27.0 — 27.5	38.09
12.5 — 13.0	23.59	27.5 — 28.0	38.59
13.0 — 13.5	24.09	28.0 — 28.5	39.09
13.5 — 14.0	24.59	28.5 — 29.0	39.59
14.0 — 14.5	25.09	29.0 — 29.5	40.09
14.5 — 15.0	25.59	29.5 — 30.0	40.59

*SPR—4 normally supplied with these operating frequencies.

Crystal Frequencies for Equipment Working through Repeaters

Drake stocks TR-33C cystals for the following frequencies which are normally available for immediate shipment. Crystals for other frequencies usually require approximately four weeks delivery.

Repeater Frequencies	
Frequency in MHz	
Transmit†	Receive
146.01	146.61
146.04	146.64
146.07	146.67
146.10	146.70
146.13	146.73
146.16	146.76
146.19	146.79
146.22	146.82
146.25	146.85
146.28	146.88
146.31	146.91
146.34	146.94
146.37	146.97

Simplex Frequencies	
Frequency in MHz	
Transmit†	Receive
146.40	146.40
146.43	146.43
146.46	146.46
146.49	146.49
146.52	146.52
146.55	146.55
146.58	146.58

NOTE: Orders for crystals outside the 2 Meter Band will not be accepted.

†Standard Repeater and Simplex frequencies. Separate Transmit Crystals are not needed for the TR-33C since it uses a single Crystal per channel and has built-in standard Transmit offsets. Special offsets available.

SPR-4 CRYSTAL KITS

Amateur Bands—160m, 80m, 20m, 15m and 10m ranges. Six crystals cover:

1.5 — 2.0 MHz
3.5 — 4.0
14.0 — 14.5
21.0 — 21.5 MHz
28.0 — 28.5
28.5 — 29.0

Marine Bands—Eleven crystals cover:

2.0 — 2.5 MHz
2.5 — 3.0
4.0 — 4.5
8.0 — 8.5
8.5 — 9.0 MHz
12.0 — 12.5
13.0 — 13.5
16.5 — 17.0
17.0 — 17.5 MHz
22.0 — 22.5
22.5 — 23.0

Aeronautical Overseas—Seven crystals cover:

2.5 — 3.0 MHz
3.0 — 3.5
4.5 — 5.0
5.5 — 6.0
6.5 — 7.0 MHz
8.5 — 9.0
13.0 — 13.5

Time & Frequency Standard, WWV—Five crystals cover:

2.5 — 3.0 MHz
5.0 — 5.5
10.0 — 10.5
15.0 — 15.5 MHz (orginal equipment)
20.0 — 20.5
25.0 — 25.5

Citizens Band—One crystal and Frequency chart:

27.0 — 27.5 MHz* (*Generous overtravel gives additional 50 kHz or more off ends of each range).

Tropical Broadcast—Three crystals cover:

2.0 — 2.5 MHz
3.0 — 3.5 MHz
4.5 — 5.0 MHz

MARS—Five crystals cover:

2.0 — 2.5 MHz
3.0 — 3.5
4.0 — 4.5 MHz
5.0 — 5.5
18.0 — 18.5 MHz

Teletype Commercial—UPI, AP, Stock Market, Weather, etc.—Four crystals cover:

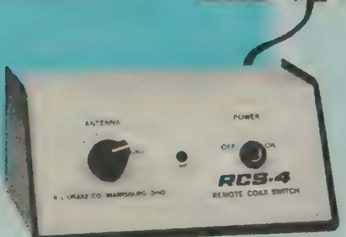
7.5 — 8.0 MHz
9.0 — 9.5
13.5 — 14.0 MHz
15.5 — 16.0

Remote Coax Switch

Model No. 1518

Drake RCS-4

- **Remotely Selects One of Five Antennas**
- **Grounds All Unused Antennas**
- **Grounds All Antennas in Gnd Position for Lightning Protection**
- **Front Panel Indicator Monitors Antenna Selection Interval**
- **Protected Against Adverse Weather Conditions**
- **SO-239 Connectors Provided for Main Coax Feed-Line and Individual Antenna Feed-Lines**
- **Handles 2000 Watts PEP**
- **Available in 120 V-ac or 240 V-ac 50/60Hz Versions**



• Control unit works on 110/220 V-ac, 50/60 Hz, and supplies necessary voltage to motor. • Excellent for single coax feed to multiband quads or arrays of monobanders. The five positions allow a single coax feed to three beams and two dipoles, or other similar combinations. • Control cable (not supplied) same as for HAM-M rotator. • Selects antennas remotely, grounds all unused antennas. Gnd position grounds all antennas when leaving station. "Rain-Hat" construction shields motor and switches. • Up to 30 MHz, insertion of switch changes VSWR no more than 1.05:1. • From 30 MHz to 150 MHz, insertion changes VSWR no more than 1.5:1. • Motor: 24 V-ac, 2 amp. Lubrication good to −40°F. • Switch Rf Capability: Maximum legal limit.

Push Button Encoding Mike

Model No. 1525

Drake 1525EM

- Microphone and auto-patch encoder in single convenient package with coil cord and connector. Fully wired and ready for use.
- High accuracy IC tone generator, no frequency adjustments.
- High reliability Digitran® keyboard.
- Power for tone encoder obtained from transceiver through microphone cable. No battery required. Low current drain.
- Low output impedance allows use with almost all transceivers.
- Four pin microphone plug: directly connects to Drake TR-33C without any modification in transceiver. Compatible with all previous Drake and other 2 meter units with minor modifications.
- Tone level adjustable.
- Hang-up hook supplied.

SPECIFICATIONS:

• **Microphone Element Type:** Low impedance dynamic • **Frequency Response:** 300-5000 Hz • **Output Impedance:** 500 ohms • **Microphone Output Level:** −72 dBm per microbar. Approx 3mV (−47dBm) with average voice level • **Tone Encoder:** Single integrated circuit dual tone synthesizer • **Encoder Audio Level:** Adjustable from approx 1mV to 5mV with internal potentiometer • **Encoder Frequency Tolerance:** Better than ±1% from −20°C to +50°C • **Encoder Supply Voltage:** 7.5 to 15 Volts (Obtained through microphone cable from transceiver) • **Encoder Current Drain:** 5 to 20 mA depending on supply voltage • **Encoder Keyboard:** High reliability Digitran® keyboard • **Microphone Hanger:** Hook supplied • **Dimensions:** 2.6" x 3.5" x 1.7" (6.6 x 8.9 x 4.3 cm) • **Weight:** 8 oz. (.227 kg)

Drake 1525EM, microphone with tone encoder and connector for TR-33C, TR-72, TR-22C, ML-2

Drake 7073DM as above but without tone encoder

R. L. DRAKE COMPANY DRAKE®

540 Richard St., Miamisburg, Ohio 45342
Phone: (513) 866-2421 • Telex: 288-017

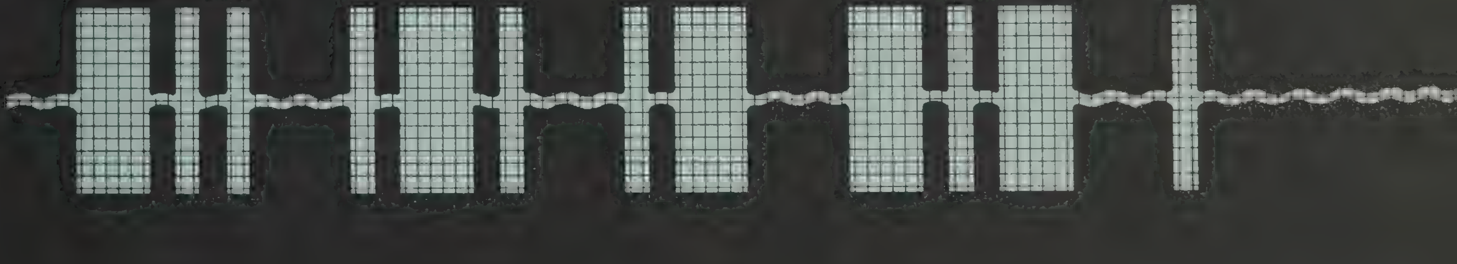
Western Sales and Service Center, 2020 Western Street, Las Vegas, Nevada 89102 • 702/382-9470

LITHO IN U.S.A.

JANUARY 1977

DRAKE®

Equipment for Radio Communications

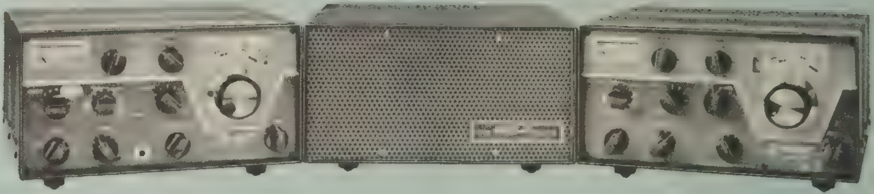


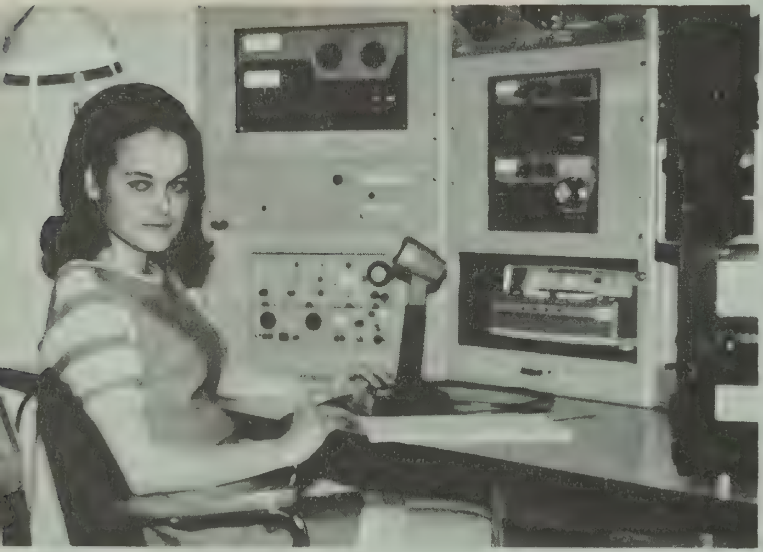
FULL LINE CATALOG

DRAKE®

Known throughout the world for quality...

Radio Communications Equipment





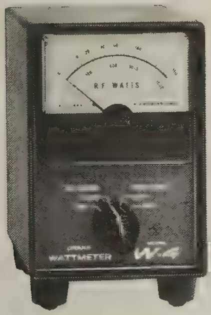
Seeking a better way, in 1943 a young electrical engineer, with a significant background in radio design for major industrial concerns, launched the R.L. DRAKE COMPANY.

From a modest beginning, Robert L. Drake guided the growth of his company to a position of international importance in the communications field. Today, all over the world, wherever radio communications equipment is used, the name DRAKE is held in high esteem.

The extraordinary acceptance of DRAKE products rests on a solid foundation of customer satisfaction . . . in the outstanding performance of Drake Radio products.

R. L. DRAKE COMPANY
540 Richard Street, Miamisburg, Ohio 45342
Phone (513) 866-2421 • Telex 288-017

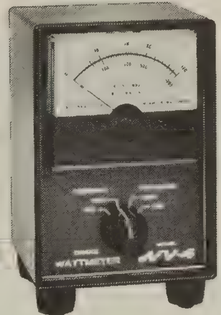
Drake Directional RF Wattmeters



Model No. 1513

Drake W-4

1.8-54 MHz



Model No. 1515

Drake WV-4

20-200 MHz

Drake directional, through line wattmeters, using printed circuits, toroids, and state of the art techniques, permit versatile performance and unsurpassed accuracy, yet at a lower cost.

In contrast to VSWR measuring devices of the past, Drake wattmeters are frequency insensitive throughout their specified range, requiring no adjustments for power or VSWR measurements.

Negligible insertion loss allows continuous monitoring of either forward or reflected power for fast accurate tune up and checking of transmitter-antenna performance.

Indirectly measure radiated power (forward power minus reflected power) and VSWR by means of a plastic nomogram included.

Each wattmeter makes possible quick, accurate adjustments of antenna resonance and impedance match, when placed between transmitter and matching network.

High accuracy; ideal as laboratory instruments.

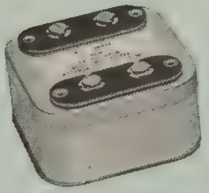
Removable coupler allows remote metering.

Specifications	W-4	WV-4
Frequency Coverage	1.8-54 MHz	20-200 MHz
Line Impedance	50 ohm resistive	50 ohm resistive
Power Capability	2000 W continuous	1000 W continuous
Jacks, Removable Coupler	Two S0239 input and output connectors	Type N input and output connectors.
Semiconductors	Two 1N295 power meter rectifiers	Two 1N695 power meter rectifiers
Accuracy	± (5% of reading +1% of full scale)	
VSWR Insertion	Insertion of wattmeter in line changes VSWR no more than 1.05:1	
Size—Cabinet:	6″H x 3.7″W x 4″D (15.3 x 9.4 x 10.2 cm)	
Coupler:	2.3″H x 3.5″W x 2.5″D (5.7 x 8.9 x 6.4 cm)	
Shipping—Weight:	3 lbs. (1.4 kg)	
Size:	8 x 5.8 x 7″ (20.3 x 14.6 x 17.8 cm)	
CONTROLS	Front panel 4 position switch selects scale and reflected power.	

Drake TVI Filters

High Pass Filters for TV Sets

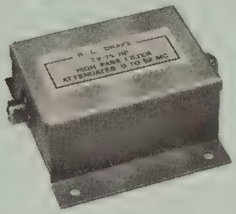
provide more than 40 dB attenuation at 52 MHz and lower. Protect the TV set from amateur transmitters 6-160 meters.



Model No. 1603

Drake TV-300-HP

For 300 ohm twin lead



Model No. 1610

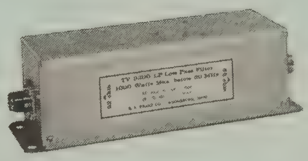
Drake TV-75-HP

For 75 ohm TV coaxial cable; TV type connectors installed

Low Pass Filters for Transmitters

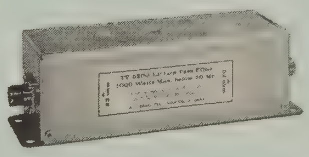
have four pi sections for sharp cut off below channel 2, and to attenuate transmitter harmonics falling in any TV channel and fm band. 52 ohm. SO-239 connectors built in.

Model No. 1608 **Drake TV-3300-LP**



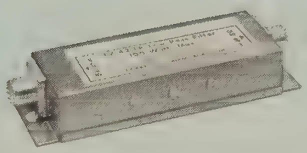
1000 watts max. below 30 MHz. Attenuation better than 80 dB above 41 MHz. Helps TV i-f interference, as well as TV front-end problems.

Model No. 1609 **Drake TV-5200-LP**



200 watts to 52 MHz. Ideal for six meters. For operation below six meters, use TV-3300-LP or TV-42-LP.

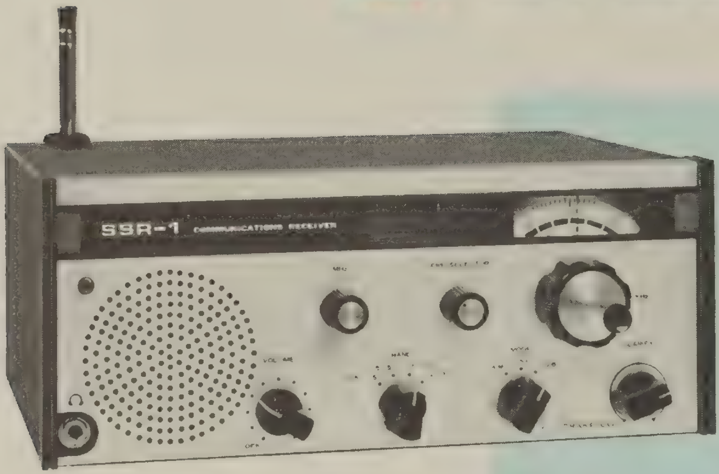
Model No. 1605 **Drake TV-42-LP**



is a four section filter designed with 43.2 MHz cut-off and extremely high attenuation in all TV channels for transmitters operating at 30 MHz and lower. Rated 100 watts input.

Model No.
8201

Drake SSR-1



- Synthesized
- General Coverage
- Low Cost
- Selectable Sidebands
- All Solid State
- Built-in Ac Power Supply
- Excellent Performance

The SSR-1 Receiver provides precision tuning over the short wave spectrum of 0.5 to 30 MHz with capability of reception of a-m (amplitude modulated), cw (continuous wave) and ssb (upper and lower single side band) signals.

A synthesized/drift-cancelling 1st mixer injection system giving thirty tunable ranges from 0.5 to 30 MHz is derived from a single 10 MHz crystal oscillator providing frequency stability necessary for ssb operation.

A stable low frequency VFO tunes each of the 30 one-MHz ranges with a dial accuracy of better than 5 kHz which is sufficient to locate and identify a station whose frequency is known.

Separate detectors (product and diode) are used to provide for best performance whether listening to ssb or a-m signals. Narrow band selectivity for ssb and wide band selectivity for a-m reception is provided.

A manual tuned preselector provides for maximum sensitivity and maximum interference rejection.

Solid state circuitry throughout allows efficient operation from built-in ac power supply, internal batteries or external 12 V-dc source.

FRONT PANEL CONTROLS

MHz: Sets the MHz range of the received frequency. This control tunes the smaller inner dial (1) and is adjusted for the center of the desired MHz range.

Signal Meter: Indicates relative rf input signal level.

Pre-selector: Adjusts receiver rf tuned circuits for proper reception of signal. This control is tuned for maximum signal or noise at the selected frequency.

Frequency Display: Indicates tuned frequency.

The inner dial indicates MHz range and the outer dial indicates kHz reading. As an example: 5.750 MHz.

kHz: Tunes the kHz range of the receiver. This control turns the large outer dial (2) and is adjusted for the proper frequency as displayed on the graduations. This dial has a graduated scale from 000 to 1000 and is read as 0 to 1000 kHz or .000 to 1.000 MHz.

Clarify: Provides ultra fine frequency adjustment (approximately ±3 kHz range). This control is used primarily on ssb and cw signals for setting the pitch or sound accurately after the station has been roughly tuned in. It should be in the center position before any tuning is commenced.

Mode: Selects mode of reception. A-m (amplitude modulation), usb (upper single side band) and lsb (lower single side band). Cw (continuous wave) may be received on either usb or lsb position. The mode selector selects the proper detector (product detector for ssb and diode detector for a-m and i-f selectivity filter.

Band: Selects the proper range of received frequency.

Off-Volume: Turns radio on and off and adjusts audio output level.

Phone Jack: For ear phone reception or external speaker (8 ohms). Insertion of jack disconnects internal speaker.

Pilot Lamp Switch: On ac operation the pilot lamps are always lighted. The pilot lamps are normally extinguished on battery operation to conserve battery life. Pushing this momentary action switch turns on the pilot lamps.

Built-in Telescoping Antenna: The SSR-1 has such sensitivity that it operates near maximum practical limits. For optimum results, the receiver should be connected to an external antenna.

BACK PANEL CONTROLS

Record, External Battery, Mute Jack, Antenna Terminal Strip, Antenna Attenuator, Fuse.

DRAKE SSR-1 SPECIFICATIONS

I-f Rejection:
Greater than 50 dB @ f_d below 20 MHz.
Greater than 40 dB @ f_d above 20 MHz.

Antenna: Self contained telescopic whip antenna. External connection to terminal strip. (75 ohm input impedance—unbalanced.)

Frequency Coverage: 0.5 to 30 MHz in 30 ranges each tunable over 1 MHz range with a dial having 10 kHz graduations.

Reception Modes: Cw, usb, lsb, a-m.

Sensitivity: At least 10 dB S+N/N under the following conditions:

Mode	Freq.	Input Level*
Ssb	0.5-2 MHz	1.0μV
	2-30 MHz	0.3μV
A-m	0.5-2 MHz	3.0μV
	2-30 MHz	1.0μV

(A-m: 1000 Hz @ 30% modulation.)

Output: Capable of 200 mW output on ssb at 2 MHz with input signal of 0.5μV and 2 watts output with 5μV input.

Audio Distortion: Less than 5% @ 2 watts.

Calibration Accuracy: Within 5 kHz at all frequencies.

Selectivity Mode	Bandwidth 6 dB
Ssb	3 kHz ±25%
A-m	5.5 kHz ±25%

Image Rejection: Greater than 50 dB

Audio Output Provisions: Internal 8 ohm speaker and phone jack on front panel that disables speaker when plugged in.

Muting Provisions: External mute jack (RCA type) that provides normal reception with closed circuit and mute with open circuit connections.

Power Supply: 8 type "D" (1.5 V) dry cell batteries (not included). Tapped transformer to provide operation from 117 V ±15% or 240 V ±10%-20%, 50-60 Hz source with automatic switch over to batteries when ac line is disconnected.

Current Consumption: Less than 100 mA quiescent at 12 V-dc.

Dial Lights: Momentary push button to light when on battery operation. Always on for ac operation.

Clarifier: Tunes minimum of ±2 kHz and maximum of ±5 kHz.

Size: 5.5″H x 13″W x 11″D (14 x 33 x 28 cm).

Weight: 14 lbs. (6.4 kg)

**These voltages are ½ the open circuit signal generator voltage, i.e., the voltage read on the meter of a HP Model 606 Generator.*

ACCESSORIES AVAILABLE:

Model No. 7078 **Drake HS-1 Headphones,**
Model No. 8202 **Drake DC-PC Dc Power Cord,**
Model No. 1237 **Drake AN-5 Antenna Kit,**
Model No. 7040 **World Radio & TV Handbook.**

Model No.
1221

Drake SPR-4

- Programmable to meet specific requirements: SWL, Amateur, Laboratory, Broadcast, Marine Radio, etc.
- Direct frequency dialing: 150-500 kHz plus any 23 500 kHz ranges, 0.5 to 30 MHz
- FET circuitry, all solid state
- Linear dial, 1 kHz readout
- Band-widths for cw, ssb, a-m with built-in LC filter
- Crystals supplied for LW, seven SW, and bc bands
- Notch filter
- Built-in speaker

The Drake model SPR-4 communications receiver may be programmed to suit your present and future needs. It is ideal for short wave listening or monitoring, aircraft radio and weather, marine ship and shore stations, hf communications, WWV time signals, CB, standard broadcast monitoring or DXing, amateur radio, civil defense, government, or use as a laboratory instrument.

In designing the SPR-4, Drake engineers incorporated the dual gate FET to produce the first no-compromise solid state receiver. Unlike receivers with bipolar transistors which have poor cross-modulation, intermodulation, agc, and overload performance; the SPR-4 has signal handling capabilities superior to the best tube receivers. In addition, the SPR-4 has all of the advantages of a solid-state design such as low power consumption, mechanical and thermal stability, reliability, etc.

The SPR-4 comes with ten bands installed which cover long wave, standard broadcast, and seven shortwave broadcast bands. Other bands, each with 500 kHz tuning range, can be added by purchasing a crystal which comes with an adhesive transparent dial sector for that range. A total of 24 bands are possible from 150 kHz to 30 MHz.

The main tuning dial reads 0 to 500 kHz with 1 kHz graduation marks using two concentric transparent discs, 0 to 100 kHz is indicated on one disc and hundreds of kHz are indicated on the other disc.

DRAKE SPR-4 SPECIFICATIONS

Frequency Coverage: Can be programmed with accessory crystals for 23 ranges (each tuning a 500 kHz band) from 0.5 to 30 MHz plus 150 to 500 kHz. Crystals supplied with the receiver allow coverage on these ranges: 150-500 kHz, 0.5-1.0 MHz, 1.0-1.6 MHz*, 6.0-6.5 MHz, 7.0-7.5 MHz, 9.5-10 MHz, 11.5-12 MHz, 15-15.5 MHz, 17.5-18 MHz, 21.5-22 MHz.

Modes of Operation: A-m, cw, lsb, usb, (RTTY with RY-4 accessory installed).

Selectivity: A-m: 4.8 kHz @ -6 dB, 10 kHz @ -60 dB. Ssb: 2.4 kHz @ -6 dB, 7.2 kHz @ -60 dB. Cw: 0.4 kHz @ -6 dB, 2.7 kHz @ -60 dB.

Intermediate Frequencies: 1st i-f 5645 kHz four pole crystal lattice filter, 2nd i-f 50 kHz four pole Hi-Q Ferrite LC filter.

Frequency Stability: At room temperature, drift for all causes (including ± 10% change in supply voltage) is less than ± 100 Hz.

Sensitivity: Ssb and cw: 0.25 microvolt for 10 dB S+N/N, a-m: 0.5 microvolt with 30% modulation for 10 dB S+N/N.

Image Rejection: Greater than 60 dB below 15 MHz. Greater than 50 dB above 15 MHz.

Blocking: An undesired unmodulated signal at least 20 kHz above or below a desired signal of .25 microvolt must be 90 dB stronger than the .25 microvolt signal to cause a 3 dB reduction of the signal to noise ratio of the desired signal.

Cross Modulation: An unwanted signal (modulated 30% at 1 kHz) removed by at least 20 kHz from a desired signal of 1 microvolt, must have a signal level of at least 10 millivolts to produce a noticeable crossmodulation of the desired signal.

Intermodulation: Using a reference signal of .25 microvolt, two interfering signals of equal strength within the passband of the receiver front-end selectivity must each have a strength of at least 65 dB above the reference signal to produce third order products equal to the .25 microvolt reference signal.

Automatic Gain Control: Agc is used on a-m, cw, and ssb. Time constants are selected for the optimum effectiveness on each mode. Audio output is held constant to 6 dB over a 100 dB range of input signals. Jumper wire allows choice of fast or slow release on cw.

Input Impedance: 50 ohms approximately (high impedance 150 kHz to 1500 kHz)

Excessive Rf Input Voltage Protection: Withstands 30 volts rms from a 50 ohm generator continuously.

Output Power: 3 watts into 4 ohm load (less into higher impedance loads).

Power Consumption: 18 watts on 120 V-ac or 5¾ watts on 12 V-dc, 2.5 watts on 12 V-dc with dial lights turned off and with audio output adjusted for normal listening level.

Calibration: Dial is accurate to better than ± 1 kHz when calibrated at nearest 100 kHz calibration point.

Hum and Noise: More than 60 dB below rated output.

Size and Weight: 5.5"H x 10.8"W x 12.3"D (14 x 27.4 x 31.2 cm), 18 lbs (8.2 kg).

**Generous overtravel gives additional 50 kHz or more off each end of range.*

ACCESSORIES

Matching Speaker: Same size as SPR-4, has 5 x 7 speaker. Model No. 1511 Drake MS-4.

Calibrator: Plug-in 100 kHz crystal oscillator with harmonics that occur at 100 kHz intervals throughout the range of SPR-4. Model No. 1223 Drake SCC-4.

Noise Blanker: Plug-in i-f type noise blanker mutes receiver for duration of each noise pulse. 16 transistors, 2 diodes. Model No. 1227 Drake 5-NB.

Loop Antenna: Directional antenna nulls out undesired stations, plugs into receptacle through top of the cabinet, operates from 150 kHz to 1600 kHz only. Model No. 1235 Drake AL-4.

Antenna Kit: Consists of wire, insulators, lead-in, and instructions. Model No. 1237 Drake AN-5.

Dc Power Cord: Plugs into cigar lighter in an automobile, allows SPR-4 to be used on 12 volts dc supply. Model No. 1229 Drake DC-PC.

Teletype Adapter: Allows reception of standard teletype tones 2125/2975 Hz and 2125/2295 Hz by remote shifting BFO. Model No. 1225 Drake RY-4.

Transceive Adaptor: Allows SPR-4 to transceive with all T-4 and T-4X Transmitters. Consists of printed circuit board and connectors. Model No. 1224 Drake TA-4.

Headphone: Model No. 7078 Drake HS-1.

Model No.
1242

Drake DSR-2

- **Continuous Coverage 10 kHz to 30 MHz**
- **Digital Synthesizer Frequency Control**
- **Frequency Displayed to 100 Hz**
- **All Solid State**
- **A-m, Ssb, Cw, RTTY, Isb**
- **Series Balanced Gate Noise Blanker**
- **Front End Protection**
- **Optional Features Available on Special Order**

The R. L. Drake Model DSR-2 Receiver is a high grade communications receiver employing the most up-to-date solid state devices and circuitry. It provides continuous coverage from 10 kHz to 30 MHz. The received frequency is displayed on six nixie tubes to the nearest 100 Hz.

Frequency injections of the DSR-2 are controlled by a phase-locked digital synthesizer which allows incremental frequency selection in 10, 1, and 0.1 MHz steps. The remaining 0 to 0.1 MHz is continuously adjustable by a highly stable variable oscillator controlled from the fine tuning knob on the front panel. Modular construction on easily accessible printed circuit boards is used throughout the DSR-2. Extensive use of dual gate MOSFET transistors in the DSR-2 circuitry contributes to its superior intermodulation, avc, wide dynamic range and overload performance.

The front panel controls allow the operator to select frequency (with fine tune control), a-m or ssb product detector, i-f bandwidth, af gain, BFO pitch, fast or slow avc, manual rf gain, standby position, and the highly effective Drake series gate noise blanker. Isb (Independent Sideband) is a built-in feature of the DSR-2. Separate i-f crystal filter, i-f amplifier, and audio output circuits allow two simultaneous communication channels to be employed on one frequency assignment, doubling the information receiving capacity.

Front-end protection includes special circuitry built-in to provide protection against transmitters

in close proximity. It will withstand a 30 volt emf from a 50 ohm source, with the receiver on or off.

The normal avc system has appropriate attack and decay times to provide proper clean reception of ssb and cw signals. This avc system operates on both the rf and i-f circuitry to provide reception free of 'popping.' The rf avc provides an additional control under very strong signal conditions to increase the dynamic range. Front panel controls are available to decrease the decay time of the avc circuitry, to disconnect the avc circuitry and to provide manual control.

DRAKE DSR-2 SPECIFICATIONS

Frequency Range: 10 kHz to 30 MHz continuous range.

Modes of Operation: Usb, lsb, cw, RTTY, a-m, isb.

Frequency Readout: Complete to 100 Hz on six Nixie tubes.

Frequency Selection: 10 MHz, 1 MHz, 0.1 MHz steps switch selected. 0 to 0.1 MHz continuously variable.

Frequency Stability: Frequency drift does not exceed 200 Hz in any 8 hour period at constant ambient temperature between 0° and 40°C and ± 10% variation from nominal line voltage after ½ hour warmup.

Sensitivity: 0.01—0.5 MHz: Less than 4 microvolts for 10 dB SINAD at 2.4 kHz ssb mode. Less than 25 microvolts for 10 dB SINAD at 6 kHz a-m mode with 30% modulation. 0.5—30 MHz: Less than 0.3 microvolts for 10 dB SINAD at 2.4 kHz ssb mode. Less than 2 microvolts for 10 dB SINAD at 6 kHz a-m mode with 30% modulation.

Image Rejection: Greater than 60 dB relative to 1 microvolt below 10 MHz. Greater than 50 dB relative to 1 microvolt above 10 MHz.

I-f rejection: Greater than 60 dB relative to 1 microvolt except in range of 4.5 to 5.5 MHz.

Rf Blocking: Greater than 100 dB relative to 1 microvolt.
*Desired signal at 60 dB above 1 microvolt with a blocking signal removed 20 kHz and its amplitude adjusted to reduce desired signal 3 dB.

Crossmodulation: 70 dB relative to 1 microvolt.
*Desired signal at 60 dB above 1 microvolt with undesired signal removed 20 kHz and its amplitude adjusted for crossmodulation products 30 dB lower than desired signal.

Intermodulation: 70 dB relative to 1 microvolt.
*Level of two undesired signals, removed at least 30 kHz from the desired frequency, required to produce the equivalent audio output as desired signal 30 dB greater than 1 microvolt.

Opposite Sideband Suppression: Greater than 60 dB at 500 Hz into the opposite sideband.

I-f Bandwidth (in kHz):

Selectivity	**−6 dB**	**−60 dB**
6	6	11.5
2.4	2.4	4.3
1.2	1.2	2.4
0.3	0.3	0.6

Optional filters available for other bandwidths.

Automatic Volume Control: Audio output increases less than 3 dB for an rf input change of 100 dB.

Attack Time	1 millisecond
Release Time: (normal avc)	1 second
(fast avc)	100 milliseconds

Antenna Input Impedance:

10 kHz to 500 kHz	1000 ohms
500 kHz to 30 MHz	50 ohms

Antenna Input Protection: The receiver has built-in protection to prevent damage from a 30 volt signal applied to the antenna for a 15 minute period.

Audio Output: Communications channel: 2 watts at 5% maximum distortion into 4 ohm load (4 ohms unbalanced). 1 milliwatt into 600 ohm load (600 ohms balanced and center tapped). Isb channel: 1 milliwatt into 600 ohm load (600 ohms balanced and center tapped).

Audio Hum and Noise: Greater than 60 dB below rated output.

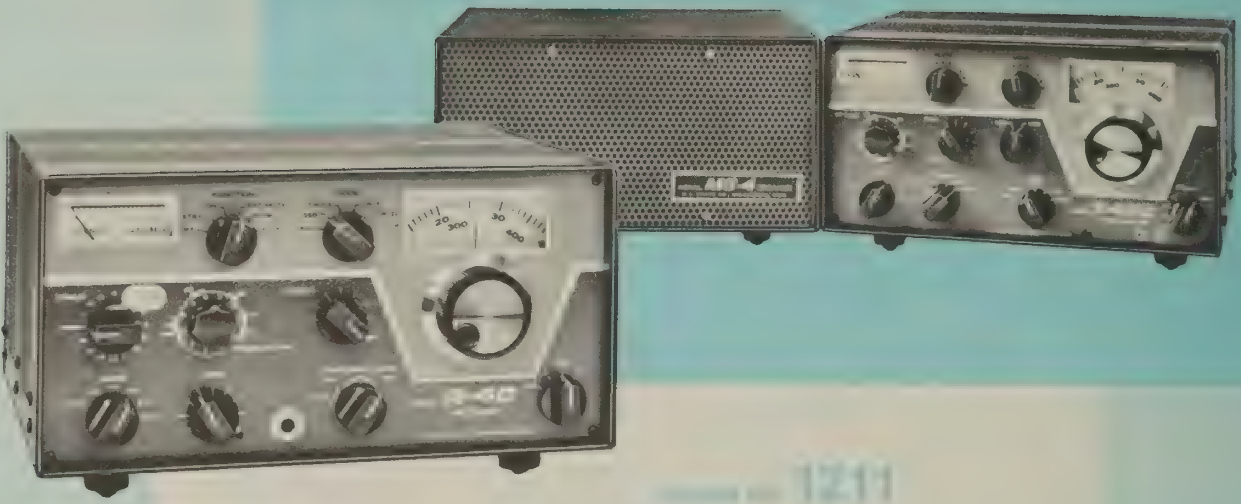
BFO: Derived from 5 MHz standard oscillator, or variable over a ± 3 kHz range from front panel control.

Power Requirements: 120/240 volts ± 10% single phase 50 to 420 Hz, 35 watts.

Dimensions: 5.5″H x 13.4″W x 15″D (14 x 34 x 38 cm).

Weight: 17 lbs (7.7 kg).

**Measurement Procedure*



1211

Drake R-4C

Solid State Linear permeability-tuned VFO with 1 kHz dial divisions. Gear driven dual circular dials. High mechanical, electrical and temperature stability.

Covers ham bands with crystals furnished. Covers all of 80, 40, 20 and 15 meters, and 28.5-29.0 MHz of 10 meters.

Covers 160 meters with accessory crystal. In addition to the ham bands, tunes any fifteen 500 kHz ranges between 1.5 and 30 MHz, 5.0 to 6.0 MHz not recommended. Can be used for MARS, WWV, CB, Marine and Shortwave broadcasts.

Superior selectivity: 2.4 kHz 8-pole filter provided in ssb positions. 8.0 kHz, 6 pole selectivity for a-m. Optional 8-pole filters of .25, .5, 1.5 and 6.0 kHz bandwidths available.

Tunable notch filter attenuates carriers within passband.

Smooth and precise passband tuning.

Transceive capability; may be used to transceive with the T-4X, T-4XB or T-4XC Transmitters. Illuminated dial shows which PTO is in use.

Usb, lsb, a-m and cw on all bands.

Agc with fast attack and two release times for ssb and a-m or fast release for break-in cw. Agc also may be switched off.

New high efficiency accessory noise blanker that operates in all modes.

Crystal lattice filter in first i-f prevents cross-modulation and desensitization due to strong adjacent channel signals.

Excellent overload and intermodulation characteristics.

25 kHz Calibrator permits working closer to band edges and segments.

Scratch resistant epoxy paint finish.

DRAKE R-4C SPECIFICATIONS

Frequency Coverage: 3.5-4.0 MHz, 7.0-7.5 MHz, 14.0-14.5 MHz, 21.0-21.5 MHz and 28.5-29.0 MHz with crystals supplied. Fifteen accessory crystal sockets are provided for coverage of any 15 additional 500 kHz ranges between 1.5 and 30.0 MHz with the exception of 5.0-6.0 MHz.

Selectivity: Ssb—2.4 kHz at 6 dB down, 4.2 kHz at 60 dB down. A-m—8.0 kHz at 6 dB down, 28.0 kHz at 60 dB down. Filters with 0.25, 0.5, 1.5 and 6.0 kHz bandwidths at the −6 dB points are available for the cw1, cw2 and a-m modes. Product detection is used in the ssb, cw1 and cw2 modes; diode detection is used in the a-m mode. Agc switching is independent of mode switching.

I-f Frequencies: First i-f 5645 MHz wth 4-pole crystal filter. **Second** i-f 5695 MHz with 8-pole cyrstal lattice filter, and **third** i-f is 50 kHz with 2 LC tuned circuits.

Stability: Less than 100 Hz after warm-up. Less than 100 Hz for 10% change in line voltage.

Sensitivity: Less than 0.25 μV for 10 dB signal plus-noise-to-noise on all amateur bands. Less than 0.5 μV at any frequency.

Modes of Operation: Ssb, cw, a-m, RTTY, SSTV.

Dial Calibration: Main dial is calibrated from 0 to 500 kHz in 1 kHz increments. Calibration Accuracy: Better than 1 kHz when calibrated to the nearest 100 kHz point. Markers are at 25 kHz for greater accuracy.

Automatic Gain Control: Amplified agc has fast attack (less than 1 ms) and 3 selectable release times. Slow release is 1.0 second, medium release is 350 ms, and fast release is 50 ms. Audio output increases not more than 3 dB for 100 dB rf input change. (1 μV to 0.1 volt).

Audio Ouput: At least 2.0 watts into a 3.2 ohm load. 3000 ohm output available for anti-VOX.

Antenna Input Impedance: 52 ohms nominal.

Spurious Repsonses: Image rejection more than 70 dB; i-f rejection more than 70 dB on amateur ranges. Internal spurious ranges in amateur bands less than the equivalent of the 1 μV signal at the antenna.

Power Consumption: 60 watts, 120/240 V-ac, 50 to 400 Hz.

Dimensions: 5.5″H x 10.8″W x 11.7″ cabinet depth, 12.8″ overall depth (14 x 27.3 x 32.4 cm).

Weight: 17 lbs (7.7 kg).

CONTROLS AND JACKS

Front Panel: Main tuning, agc switch, passband tuning, notch filter, mode switch, function switch, preselector tuning, af and rf gain controls, bandswitch, accessory crystal switch and headphone jack.

Rear Panel: S-meter zero control, crystal filter sockets, auxiliary crystal sockets, accessory power socket, 120/240 V-ac power switch, line fuse, carrier oscillator jack, antenna jack, speaker jack, mute jack, anti-VOX/sidetone jack, PTO lamp jack and transmitter carrier oscillator jack.

C-Line Accessories

Model No. 1511

Drake MS-4 Matching Speaker

(Shown on facing page) for use with R-4, R-4A, R-4B and R-4C Receivers. (Has space to house AC-3 and AC-4 Power Supplies).

Power Supplies for T-4, T-4X, T-4XB or T-4XC (The AC-4 can be housed in an MS-4 speaker cabinet).

Model No. 1501 Drake AC-4
Model No. 1505 Drake DC-4

Accessory Bandwidth Filters available: Model No. 7011 Drake FL250, Model No. 7013 Drake FL500, Model No. 7015 Drake FL1500, Model No. 7017 Drake FL4000, Model No. 7019 Drake FL6000.

Linear Amplifier see page 15

RF Wattmeters see page 3

Matching Networks and FS-4 Synthesizer see page 14

Push Button Encoding Mike see page 20

DRAKE MICROPHONES

Wired for use with Drake transmitters and transceivers, for either push-to-talk or VOX. Type of operation is determined by the VOX control setting of the transmitter.

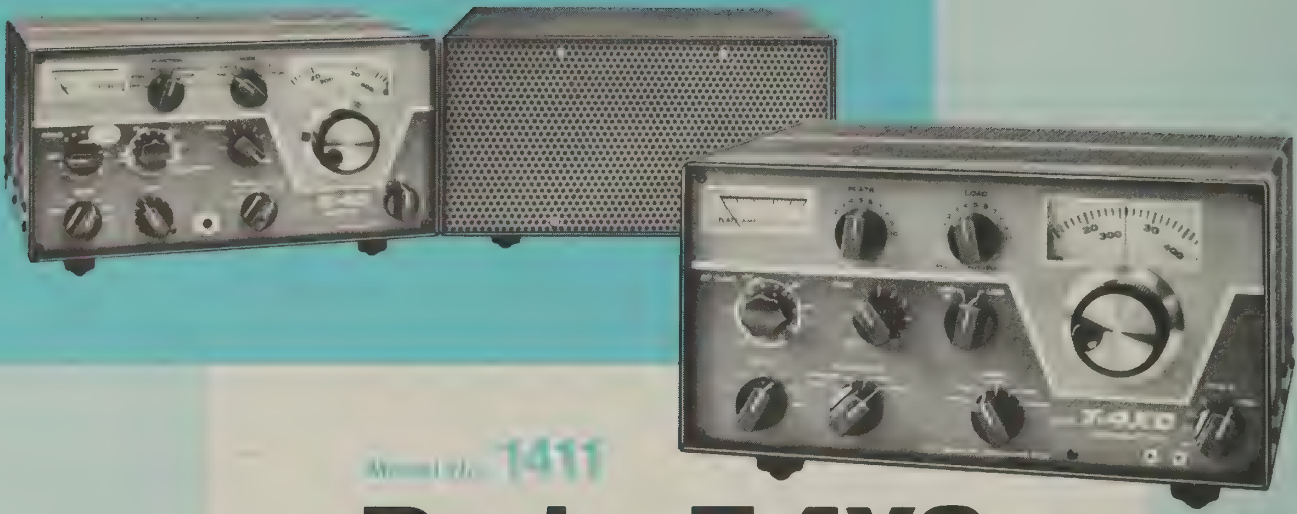
Desk Type Model No. 7075

• **Type:** Heavy Duty Ceramic Desk Top • **Cable:** Four Foot, 3-Conductor, One Shield • **Output Level:** Minus 54 dB (0 dB = 1 volt/microbar) • **Frequency Reponse:** 80-7000 Hz • **Switching:** Adapts to either push-to-talk or VOX.

Hand-Held Type Model No. 7072

• **Type:** Ceramic, hand held • **Cable:** 11″ Retracted, 5′ extended, PVC 3 Cord, 1 shielded, Coil Cord • **Case:** Cycolac • **Finish:** Grey • **Output Level:** Minus 65 dB (0 dB = 1 volt/microbar) • **Frequency Response:** 300-3000 Hz • **Switching:** Adapts to either push-to-talk or VOX.

DRAKE® C-Line Amateur Transmitter



Model No. 1411

Drake T-4XC

Solid State Linear permeability-tuned VFO with 1 kHz dial divisions. Gear driven dual circular dials. High mechanical, electrical and temperature stability.

Covers ham bands with crystals furnished. Covers all of 80, 40, 20 and 15 meters, and 28.5-29.0 MHz of 10 meters.

Covers 160 meters with accessory crystal. Four 500 kHz ranges in addition to the ham bands plus one fixed-frequency range can be switch-selected from the front panel.

Two 8-pole crystal lattice filters for sideband selection.

Transceives with the R-4, R-4A, R-4B, R-4C and SPR-4 Receivers. Switch on the T-4XC selects frequency control by receiver or transmitter PTO or independently. Illuminated dial shows which PTO is in use.

Usb, lsb, a-m and cw on all bands.

Controlled-carrier modulation for a-m is compatible with ssb linear amplifiers.

Automatic transmit-receive switching. Separate VOX time-delay adjustments for phone and cw. VOX gain is independent of microphone gain.

Choice of VOX or PTT. VOX can be disabled by front panel switch.

Adjustable pi network output.

Transmitting agc prevents flat-topping.

Meter reads relative output or plate current with switch on load control.

Built-in cw sidetone.

Spotting function for easy zero-beating.

Easily adaptable to RTTY, either fsk or afsk.

Compact size; rugged construction. Scratch resistant epoxy paint finish.

DRAKE T-4XC SPECIFICATIONS

• **Frequency Coverage:** 3.5-4.0 MHz, 7.0-7.5 MHz, 14.0-14.5 MHz, 21.0-21.5 MHz and 28.0-28.5 MHz with crystals supplied. Four accessory crystal sockets are provided for additional 500 kHz ranges between 1.8 and 30.0 MHz, excluding 2.3-3.0 MHz, 5.0-6.0 MHz and 11.0-12.0 MHz. Crystals for fixed-frequency operation may be plugged into a front-panel socket for use between 1.8 and 30.0 MHz, excluding 2.3-3.0 MHz, 5.0-6.0 MHz and 10.5-12.0 MHz. • **Dial Calibration:** Main dial is calibrated from 0 to 500 kHz in 1 kHz increments. Calibration Accuracy: Better than 1 kHz when calibrated to the nearest 100 kHz point. • **Stability:** Less than 100 Hz after warm up. Less than 100 Hz with 10% change in line voltage. • **Modes of Operation: Ssb:** Upper or lower sideband on all bands. VOX or Push-to-talk. • **Cw:** Grid-block keying. VOX circuit is keyed for automatic transmit-receive switching. Sidetone oscillator is keyed for monitoring. Shifted carrier system has no spurious outputs. • **A-m:** Controlled-carrier a-m modulation system is built in. This system is compatible with ssb linear amplifiers. VOX or push-to-talk. • **RTTY:** Two methods of RTTY are available. **1.** The VFO is easily adaptable to fsk. Signal frequency shifts the same direction on all bands and the same amount on any band with a given dial setting. **2.** The RTTY signal also may be generated by applying undistorted audio tones at the mike input in the ssb mode. A jack is provided at the rear panel to shift the carrier oscillator frequency by an amount that, in the lsb position, the frequency bandpass through the sideband filter is shifted so that the tones of 2125 and 2975 Hz will pass with equal amplitude. • **Sideband Suppression:** 60 dB or better. Carrier Suppression: 60 dB or better. • **Average Distortion Products:** at least 30 dB down. • **Frequency Response:** 350 to 2750 Hz at 6 dB down. • **Input Power:** Ssb and a-m—200 watts PEP, cw—200 watts. • **Output Impedance:** Nominal 52 ohms adjustable with pi network. (SWR should be 2:1 or less). • **Microphone Input:** High impedance. • **Agc:** Operates on ssb to prevent flat-topping due to overdrive. • **Power Requirements:** (Provided by AC-3 and AC-4 power supplies). 650 volts dc at 200 mA average and 330 mA maximum with better than 10% regulation from 50 mA to 330 mA and maximum ripple of less than 1%. 250 volts dc at 120 mA with 10% regulation from 82 mA to 120 mA. This includes the effect of the 650 volt supply change if both voltages are obtained from the same transformer. Maximum ripple must be less than ¼%. Also −45 to −65 volts dc adjustable filtered bias into a 33 k ohm load, and 12.6 volts ac or dc at 3 amps. • **Dimensions:** 5.5″H x 10.8″W x 11.7″ cabinet depth, 12.8″ overall depth (14 x 27.3 x 31.4 cm). • **Weight:** 14.6 lbs (6.6 kg).

CONTROLS AND JACKS:

• **Front:** Main tuning, accessory crystal switch, mode switch, sideband selector, band switch, transceive switch, rf tune, microphone gain, plate tuning, plate loading control with relative output swtich, and fixed-frequency crystal socket. • **Rear:** Power connector, mute jack, receiver antenna jack, antenna connector, anti-VOX/sidetone jack, receiver injection jack, RTTY carrier oscillator shift jack, carrier oscillator output jack, PTO lamp jack, microphone jack, key jack, anti-VOX/sidetone gain control, VOX gain control, VOX delay control-cw, and VOX delay control-ssb a-m.

C-Line Accessories

Model No. 1511

Drake MS-4 Matching Speaker

(Shown on facing page) for use with R-4, R-4A, R-4B and R-4C Receivers. (Has space to house AC-3 and AC-4 Power Supplies).

Power Supplies for T-4, T-4X, T-4XB or T-4XC (The AC-4 can be housed in an MS-4 speaker cabinet).
Model No. 1501 Drake AC-4
Model No. 1505 Drake DC-4

Accessory Bandwidth Filters available: Model No. 7011 Drake FL250, Model No. 7013 Drake FL500, Model No. 7015 Drake FL1500, Model No. 7017 Drake FL4000, Model No. 7019 Drake FL6000.

Linear Amplifier see page 15

RF Wattmeters see page 3

Matching Networks and FS-4 Synthesizer see page 14

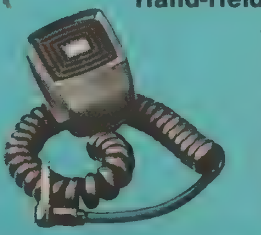
Push Button Encoding Mike see page 20

DRAKE MICROPHONES

Wired for use with Drake transmitters and transceivers, for either push-to-talk or VOX. Type of operation is determined by the VOX control setting of the transmitter.

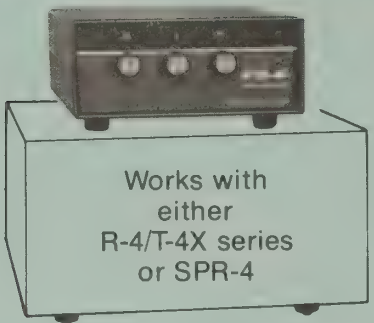
Desk Type Model No. 7075

• **Type:** Heavy Duty Ceramic Desk Top • **Cable:** Four Foot, 3-Conductor, One Shield • **Output Level:** Minus 54 dB (0 dB = 1 volt/microbar) • **Frequency Reponse:** 80-7000 Hz • **Switching:** Adapts to either push-to-talk or VOX.



Hand-Held Type Model No. 7072

• **Type:** Ceramic, hand held • **Cable:** 11″ Retracted, 5′ extended, PVC 3 Cord, 1 shielded, Coil Cord • **Case:** Cycolac • **Finish:** Grey • **Output Level:** Minus 65 dB (0 dB = 1 volt/microbar) • **Frequency Response:** 300-3000 Hz • **Switching:** Adapts to either push-to-talk or VOX.



Model No. 1520

Drake FS-4 Digital Synthesizer

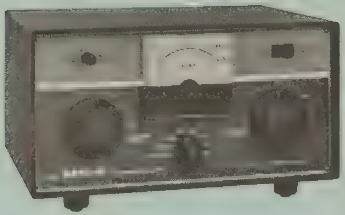
The new solid state Drake FS-4 Synthesizer opens the door to a new world of continuous-tuning short wave! Combines synthesized general coverage flexibility with the selectivity, stability, frequency readout and reliability of the Drake R-4C or SPR-4 Receivers.

• Interfaces with all R-4 series receivers and T-4X series transmitters: (R-4, R-4A, R-4B, R-4C, SPR-4, T-4, T-4X, T-4XB and T-4XC), without modification. • MHz range is set on FS-4, with kHz readout taken from receiver dial. • Complete general coverage—no range crystals to buy. • T-4/T-4X series transmitters transceive on any FS-4 frequency, when used with R-4 series receivers. • Readout 1 kHz with Drake PTO.

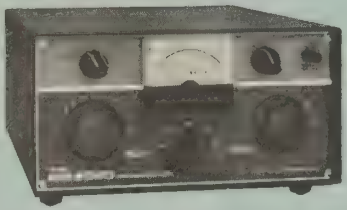
R-4C/FS-4: • Passband Tuning, Notch Filter, optional Selectable 8-pole Crystal Filter for optimum selectivity. • Continuous coverage 1.5 MHz through 30 MHz.

SPR-4/FS-4: • All solid state • Built-in L/C Filter for selectivity on am, cw, usb and lsb. • Versatile combination includes low frequency Marine and Broadcast band. • Continuous coverage 150 kHz-30 MHz. • For use with SPR-4, order Interface Kit Model 1523.

Drake MN-4 & MN-2000 Matching Networks



MN-4 (Model No. 1507)



MN-2000 (Model No. 1509)

A Drake matching network is a worthwhile addition to any amateur station where peak performance is desired. Basically identical, except for power handling capabilities, the MN-4 and MN-2000 enable feedline SWR's of 5:1 to be matched to the transmitter. If input impedance is purely resistive, even higher SWR's can be handled. • Besides presenting a 50 ohm load to the transmitter, the Matching Network's built in rf wattmeter allows accurate and continuous power measurement and VSWR indication. The advanced wattmeter circuitry yields frequency-insensitive readings from 2 to 30 MHz, and accuracy until now obtainable only in expensive wattmeters.

DRAKE MN-4 & MN-2000 SPECIFICATIONS

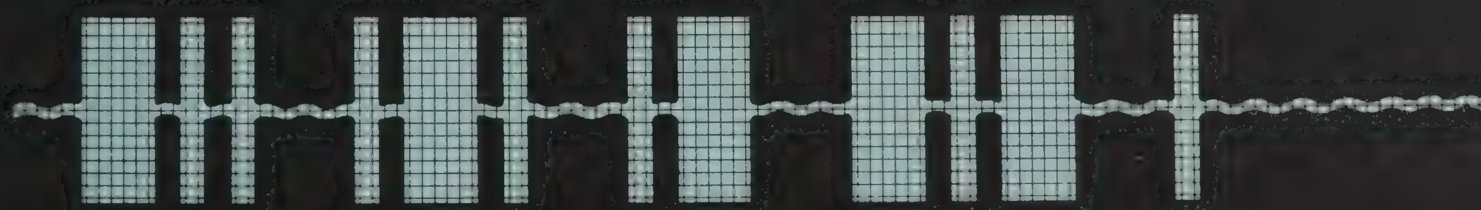
Frequency Coverage:	3.5 to 4.0 MHz, 7.0 to 7.3 MHz, 14.0 to 14.35 MHz, 21.0 to 21.45 MHz, 28.0 to 29.7 MHz	
Input Impedance:	50 ohms (resistive)	
Load Impedance:	50 ohm coax with VSWR of 5:1 or less (any impedance angle) 75 ohm coax at a lower VSWR can be used.	
Meter:	Reads forward power in watts, or VSWR	
Insertion Loss:	0.5 dB or less on each band after tuning	
	MN-4	**MN-2000**
Power Capability:	200 watts rf continuous	1000 watts rf average continuous duty, 2000 watts PEP
Wattmeter Accuracy:	± (5% of reading + 1% of full scale)	
Dimensions: (including connectors)[2]	5.5"H x 10.8"W x 8.5"D (14 x 27.3 x 21.6 cm)	5.5"H x 10.8"W x 14.4"D (14 x 27.3 x 36.5 cm)
Shipping: Weight: Dimensions:	9 lbs (4.1 kg) 11.8" x 8" x 10.3" (29.8 x 20.3 x 26 cm)	18 lbs (8.2 kg) 18" x 9" x 15" (45.7 x 22.9 x 38.1 cm)
FRONT PANEL CONTROLS	Resistive Tuning, Reactive Tuning, VSWR Calibration, Bandswitch, Watts/VSWR Selector Switch	
	—	Antenna/Dummy Load Switch
REAR PANEL	Ground Post and three SO-239 Connectors: one input, two outputs	Ground Post and four SO-239 connectors: One input, two outputs, one Alternate Antenna/Dummy Load

(Other C-Line Accessories: see page 11.)

JANUARY 1977

DRAKE®

Equipment for Radio Communications

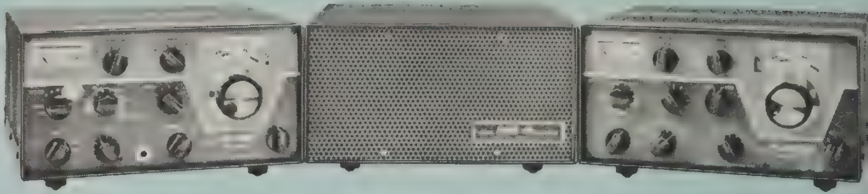


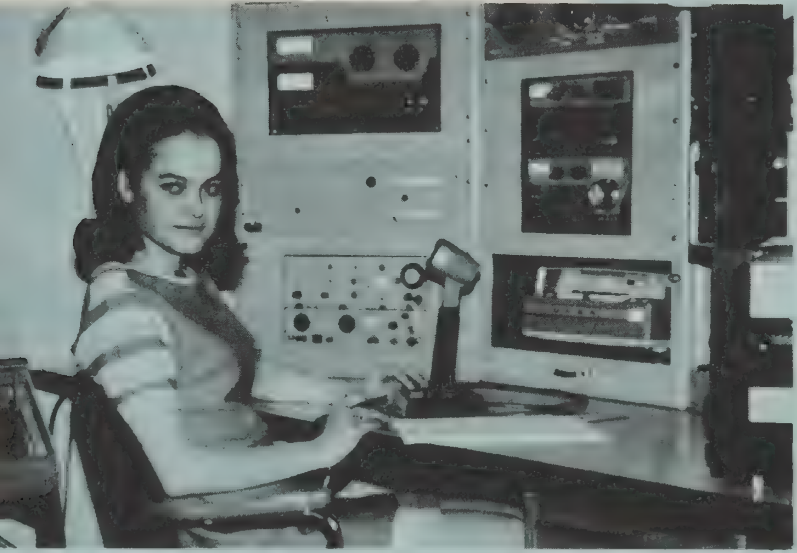
FULL LINE CATALOG

DRAKE®

Known throughout the world for quality...

Radio Communications Equipment





Seeking a better way, in 1943 a young electrical engineer, with a significant background in radio design for major industrial concerns, launched the R.L. DRAKE COMPANY.

From a modest beginning, Robert L. Drake guided the growth of his company to a position of international importance in the communications field. Today, all over the world, wherever radio communications equipment is used, the name DRAKE is held in high esteem.

The extraordinary acceptance of DRAKE products rests on a solid foundation of customer satisfaction . . . in the outstanding performance of Drake Radio products.

R. L. DRAKE COMPANY
540 Richard Street, Miamisburg, Ohio 45342
Phone (513) 866-2421 • Telex 288-017

1/77

AMATEUR EQUIPMENT PRICE LIST

Prices Effective: January 1, 1977

R.L. Drake Company, 540 Richard Street, Miamisburg, Ohio 45342
Sales Office Phone: 513-866-3621 • Telex: 288-017
Western Service Center, 2020 Western Street, Las Vegas, Nevada 89102 • 702/382-9470

Model Number	Drake Model	Description	Suggested Amateur Net
Receivers (Communications) and Accessories			
1242	DSR-2	Vlf-Hf Digital Synthesized Communications Laboratory Receiver, ssb, a-m, cw, isb, RTTY	$2950.00
1211	R-4C	Amateur Hf Receiver, 160-10 meters	599.00
1217	4-NB	Noise Blanker for R-4C	70.00
7011	FL250	Accessory I-f Filter	52.00
7013	FL500	Accessory I-f Filter	52.00
7015	FL1500	Accessory I-f Filter	52.00
7017	FL4000	Accessory I-f Filter	52.00
7019	FL6000	Accessory I-f Filter	52.00
1520	FS-4	Drake General Coverage Synthesizer for 4-line and SPR-4	250.00
1221	SPR-4	Solid State Programmable Receiver	629.00
1227	5-NB	Noise Blanker for SPR-4	70.00
1229	DC-PC	12V-dc Power Cord (fits cigarette lighter)	5.00
6006	Dial	Plain crystal selector dial for SPR-4	3.00
1225	RY-4	Teletype Adapter	20.00
1223	SCC-4	100 kHz Calibrator	20.00
1224	TA-4	Transceive Adapter	35.00
7001	KIT	Aeronautical Overseas — 7 crystals	36.40
7002	KIT	Amateur Band — 6 crystals	31.20
7003	KIT	Citizen Band — 1 crystal & freq. chart	5.25
7004	KIT	Marine Band — 11 crystals	57.20
7005	KIT	MARS — 5 crystals	26.00
7006	KIT	Teletype Commercial—UPI, AP, Stock Market, Weather, etc.—4 crystals	20.80
7007	KIT	Time & Frequency Standard — WWV — 5 crystals	26.00
7008	KIT	Tropical Broadcast — 3 crystals	15.60
8201	SSR-1	General Coverage Receiver .5 to 30.0 MHz	350.00
8202	DC-PC	SSR-1/DC-PC Power Cord	5.00
1235	AL-4	Directional Loop Antenna for SPR-4	29.00
1237	AN-5	Shortwave Antenna Kit	8.80
Transmitters			
1411	T-4XC	Amateur Hf Transmitter 160-10 meters	599.00
Transceivers and Accessories			
8333	TR-33C	2-meter Fm Transceiver, 12 channel portable	229.95
1321	AA-10	10-watt 2-meter Amplifier	49.95
1323	MMK-22	Mobile/Dash/Desk Mount for TR22C	10.00
1333	MMK-33	Mobile/Dash/Desk Mount for TR33C	12.95

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Orders of less than $15.00 subject to $1.00 handling charge.

(Continued on back)

Model Number	Drake Model	Description	Suggested Amateur Net
Tranceivers and Accessories (continued)			
1312	TR-4Cw	80-10 meter Amateur Radio Transceiver, ssb, a-m, cw	$649.00
1317	34PNB	Plug-in Noise Blanker for TR-4 series above Serial No. 31320. For factory installation add $10.00	100.00
1315	FF-1	Crystal Control for TR-4 and TR-6	46.95
1313	MMK-3	Mobile Mounting Kit for TR4 and TR6	7.00
1319	RV-4C	Remote VFO for TR-4Cw	120.00
Power Supplies			
1501	AC-4	110/220 V-ac Power Supply for all Drake 4-line equipment.	120.00
1503	AC-10	120 V-ac input 13.8 V-dc at 3 amp output for TR-22C, TR-33C, AA-10	49.95
1505	DC-4	12 V-dc Power Supply for Drake TR-4 series Transceivers	135.00
Major Accessories and Miscellaneous			
1519	L-4B	Linear Amplifier w/Power Supply and Tubes	895.00
1507	MN-4	Antenna Matching Network.	110.00
1509	MN-2000	Antenna Matching Network.	220.00
1511	MS-4	Matching Speaker for R-4B, R-4C, SPR-4, SW-4A, TR-4 & TR-6.	24.95
1513	W-4	Rf Wattmeter 1.8 to 54 MHz	72.00
1515	WV-4	Rf Wattmeter 20 to 200 MHz	84.00
7072	7072	Drake Hand Held Microphone	19.00
7075	7075	Drake Desk Top Microphone	39.00
1525	1525EM	Drake Push Button Encoding Microphone	49.95
3501	RP-500	Protects receivers operating in range 10 kHz to 30 MHz from rf voltages of up to 500 V rms from 50 ohm antenna	90.00
1518	RCS-4	Remote Control Antenna Switch	120.00
7078	HS-1	Headphones	10.00
Crystals			
7020		Crystals for 2-C, R-4B, R-4C, SW-4A, T-4XB, T-4XC, SPR-4, ML-2.	5.25
		Crystals for fixed frequency operation of tunable units/2-NT.	7.85
		Crystals for TR-22.	7.85
		Crystals for TR-72 & TR-33C	6.30
Filters for TV-sets			
1603	TV-300-HP	High Pass Filter, 300 ohms Twin-Lead.	10.60
1610	TV-75-HP	High Pass Filter, 75 ohms TV Coax.	13.25
Low Pass Filters for Transmitters			
1605	TV-42-LP	For transmitting below 30 MHz, 100 watt continuous, 50 ohms, SO-239 Connectors	14.60
1608	TV-3300-LP	1000 watts continuous to 30 MHz with sharp cutoff above 30 MHz	26.60
1609	TV-5200-LP	1000 watts continuous to 30 MHz 100 watts continuous on 6 meters	26.60
Books			
7030		TR-4Cw, T-4XC, R-4C, SPR-4, 2-C, & C-4 Manuals	5.00
		All other Instruction Manuals	3.50
7025		DSR-2 Manual	20.00
7040		World Radio & TV Handbook 1976 edition	10.95

* * *

PRICES SUBJECT TO CHANGE WITHOUT NOTICE. Orders of less than $15.00 subject to $1.00 handling charge.

Drake Directional RF Wattmeters

Model No. 1513
Drake W-4
1.8-54 MHz

Model No. 1515
Drake WV-4
20-200 MHz

Drake directional, through line wattmeters, using printed circuits, toroids, and state of the art techniques, permit versatile performance and unsurpassed accuracy, yet at a lower cost.

In contrast to VSWR measuring devices of the past, Drake wattmeters are frequency insensitive throughout their specified range, requiring no adjustments for power or VSWR measurements.

Negligible insertion loss allows continuous monitoring of either forward or reflected power for fast accurate tune up and checking of transmitter-antenna performance.

Indirectly measure radiated power (forward power minus reflected power) and VSWR by means of a plastic nomogram included.

Each wattmeter makes possible quick, accurate adjustments of antenna resonance and impedance match, when placed between transmitter and matching network.

High accuracy; ideal as laboratory instruments.

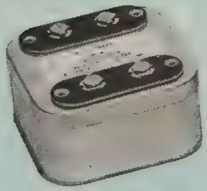
Removable coupler allows remote metering.

Specifications	W-4	WV-4
Frequency Coverage	1.8-54 MHz	20-200 MHz
Line Impedance	50 ohm resistive	50 ohm resistive
Power Capability	2000 W continuous	1000 W continuous
Jacks, Removable Coupler	Two S0239 input and output connectors	Type N input and output connectors.
Semiconductors	Two 1N295 power meter rectifiers	Two 1N695 power meter rectifiers
Accuracy	± (5% of reading +1% of full scale)	
VSWR Insertion	Insertion of wattmeter in line changes VSWR no more than 1.05:1	
Size—Cabinet: **Coupler:**	6″H x 3.7″W x 4″D (15.3 x 9.4 x 10.2 cm) 2.3″H x 3.5″W x 2.5″D (5.7 x 8.9 x 6.4 cm)	
Shipping—Weight: **Size:**	3 lbs. (1.4 kg) 8 x 5.8 x 7″ (20.3 x 14.6 x 17.8 cm)	
CONTROLS	Front panel 4 position switch selects scale and reflected power.	

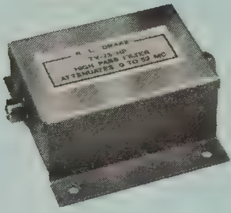
Drake TVI Filters

High Pass Filters for TV Sets

provide more than 40 dB attenuation at 52 MHz and lower. Protect the TV set from amateur transmitters 6-160 meters.



Model No. 1603
Drake TV-300-HP
For 300 ohm twin lead

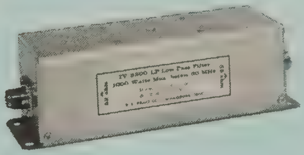


Model No. 1610
Drake TV-75-HP
For 75 ohm TV coaxial cable; TV type connectors installed

Low Pass Filters for Transmitters

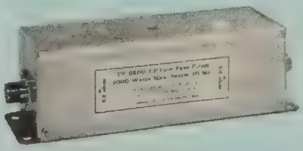
have four pi sections for sharp cut off below channel 2, and to attenuate transmitter harmonics falling in any TV channel and fm band. 52 ohm. SO-239 connectors built in.

Model No. 1608 **Drake TV-3300-LP**



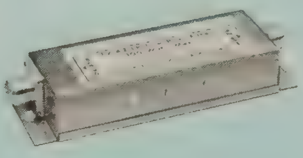
1000 watts max. below 30 MHz. Attenuation better than 80 dB above 41 MHz. Helps TV i-f interference, as well as TV front-end problems.

Model No. 1609 **Drake TV-5200-LP**



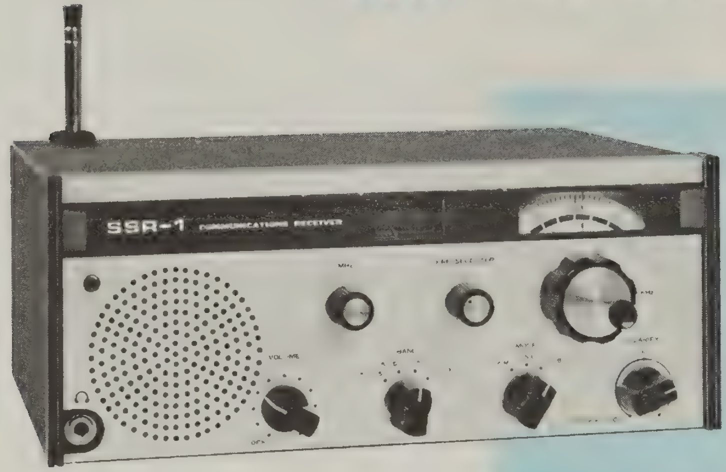
200 watts to 52 MHz. Ideal for six meters. For operation below six meters, use TV-3300-LP or TV-42-LP.

Model No. 1605 **Drake TV-42-LP**



is a four section filter designed with 43.2 MHz cut-off and extremely high attenuation in all TV channels for transmitters operating at 30 MHz and lower. Rated 100 watts input.

Model No. 8201 Drake SSR-1



- **Synthesized**
- **General Coverage**
- **Low Cost**
- **Selectable Sidebands**
- **All Solid State**
- **Built-in Ac Power Supply**
- **Excellent Performance**

The SSR-1 Receiver provides precision tuning over the short wave spectrum of 0.5 to 30 MHz with capability of reception of a-m (amplitude modulated), cw (continuous wave) and ssb (upper and lower single side band) signals.

A synthesized/drift-cancelling 1st mixer injection system giving thirty tunable ranges from 0.5 to 30 MHz is derived from a single 10 MHz crystal oscillator providing frequency stability necessary for ssb operation.

A stable low frequency VFO tunes each of the 30 one-MHz ranges with a dial accuracy of better than 5 kHz which is sufficient to locate and identify a station whose frequency is known.

Separate detectors (product and diode) are used to provide for best performance whether listening to ssb or a-m signals. Narrow band selectivity for ssb and wide band selectivity for a-m reception is provided.

A manual tuned preselector provides for maximum sensitivity and maximum interference rejection.

Solid state circuitry throughout allows efficient operation from built-in ac power supply, internal batteries or external 12 V-dc source.

FRONT PANEL CONTROLS

MHz: Sets the MHz range of the received frequency. This control tunes the smaller inner dial (1) and is adjusted for the center of the desired MHz range.

Signal Meter: Indicates relative rf input signal level.

Pre-selector: Adjusts receiver rf tuned circuits for proper reception of signal. This control is tuned for maximum signal or noise at the selected frequency.

Frequency Display: Indicates tuned frequency.

The inner dial indicates MHz range and the outer dial indicates kHz reading. As an example: 5.750 MHz.

kHz: Tunes the kHz range of the receiver. This control turns the large outer dial (2) and is adjusted for the proper frequency as displayed on the graduations. This dial has a graduated scale from 000 to 1000 and is read as 0 to 1000 kHz or .000 to 1.000 MHz.

Clarify: Provides ultra fine frequency adjustment (approximately ±3 kHz range). This control is used primarily on ssb and cw signals for setting the pitch or sound accurately after the station has been roughly tuned in. It should be in the center position before any tuning is commenced.

Mode: Selects mode of reception. A-m (amplitude modulation), usb (upper single side band) and lsb (lower single side band). Cw (continuous wave) may be received on either usb or lsb position. The mode selector selects the proper detector (product detector for ssb and diode detector for a-m and i-f selectivity filter.

Band: Selects the proper range of received frequency.

Off-Volume: Turns radio on and off and adjusts audio output level.

Phone Jack: For ear phone reception or external speaker (8 ohms). Insertion of jack disconnects internal speaker.

Pilot Lamp Switch: On ac operation the pilot lamps are always lighted. The pilot lamps are normally extinguished on battery operation to conserve battery life. Pushing this momentary action switch turns on the pilot lamps.

Built-in Telescoping Antenna: The SSR-1 has such sensitivity that it operates near maximum practical limits. For optimum results, the receiver should be connected to an external antenna.

BACK PANEL CONTROLS

Record, External Battery, Mute Jack, Antenna Terminal Strip, Antenna Attenuator, Fuse.

DRAKE SSR-1 SPECIFICATIONS

I-f Rejection:
Greater than 50 dB @ f_d below 20 MHz.
Greater than 40 dB @ f_d above 20 MHz.

Antenna: Self contained telescopic whip antenna. External connection to terminal strip. (75 ohm input impedance—unbalanced.)

Frequency Coverage: 0.5 to 30 MHz in 30 ranges each tunable over 1 MHz range with a dial having 10 kHz graduations.

Reception Modes: Cw, usb, lsb, a-m.

Sensitivity: At least 10 dB S+N/N under the following conditions:

Mode	**Freq.**	**Input Level***
Ssb	0.5-2 MHz	1.0µV
	2-30 MHz	0.3µV
A-m	0.5-2 MHz	3.0µV
	2-30 MHz	1.0µV

(A-m: 1000 Hz @ 30% modulation.)

Output: Capable of 200 mW output on ssb at 2 MHz with input signal of 0.5µV and 2 watts output with 5µV input.

Audio Distortion: Less than 5% @ 2 watts.

Calibration Accuracy: Within 5 kHz at all frequencies.

Selectivity **Mode**	**Bandwidth** **6 dB**
Ssb	3 kHz ±25%
A-m	5.5 kHz ±25%

Image Rejection: Greater than 50 dB

Audio Output Provisions: Internal 8 ohm speaker and phone jack on front panel that disables speaker when plugged in.

Muting Provisions: External mute jack (RCA type) that provides normal reception with closed circuit and mute with open circuit connections.

Power Supply: 8 type "D" (1.5 V) dry cell batteries (not included). Tapped transformer to provide operation from 117 V ±15% or 240 V ±10%-20%, 50-60 Hz source with automatic switch over to batteries when ac line is disconnected.

Current Consumption: Less than 100 mA quiescent at 12 V-dc.

Dial Lights: Momentary push button to light when on battery operation. Always on for ac operation.

Clarifier: Tunes minimum of ±2 kHz and maximum of ±5 kHz.

Size: 5.5″H x 13″W x 11″D (14 x 33 x 28 cm).

Weight: 14 lbs. (6.4 kg)

**These voltages are ½ the open circuit signal generator voltage, i.e., the voltage read on the meter of a HP Model 606 Generator.*

ACCESSORIES AVAILABLE:

Model No. 7078 **Drake HS-1 Headphones,**
Model No. 8202 **Drake DC-PC Dc Power Cord,**
Model No. 1237 **Drake AN-5 Antenna Kit,**
Model No. 7040 **World Radio & TV Handbook.**

MODEL NO.
1221

Drake SPR-4

- **Programmable to meet specific requirements: SWL, Amateur, Laboratory, Broadcast, Marine Radio, etc.**
- **Direct frequency dialing: 150-500 kHz plus any 23 500 kHz ranges, 0.5 to 30 MHz**
- **FET circuitry, all solid state**
- **Linear dial, 1 kHz readout**
- **Band-widths for cw, ssb, a-m with built-in LC filter**
- **Crystals supplied for LW, seven SW, and bc bands**
- **Notch filter**
- **Built-in speaker**

The Drake model SPR-4 communications receiver may be programmed to suit your present and future needs. It is ideal for short wave listening or monitoring, aircraft radio and weather, marine ship and shore stations, hf communications, WWV time signals, CB, standard broadcast monitoring or DXing, amateur radio, civil defense, government, or use as a laboratory instrument.

In designing the SPR-4, Drake engineers incorporated the dual gate FET to produce the first no-compromise solid state receiver. Unlike receivers with bipolar transistors which have poor cross-modulation, intermodulation, agc, and overload performance; the SPR-4 has signal handling capabilities superior to the best tube receivers. In addition, the SPR-4 has all of the advantages of a solid-state design such as low power consumption, mechanical and thermal stability, reliability, etc.

The SPR-4 comes with ten bands installed which cover long wave, standard broadcast, and seven shortwave broadcast bands. Other bands, each with 500 kHz tuning range, can be added by purchasing a crystal which comes with an adhesive transparent dial sector for that range. A total of 24 bands are possible from 150 kHz to 30 MHz.

The main tuning dial reads 0 to 500 kHz with 1 kHz graduation marks using two concentric transparent discs, 0 to 100 kHz is indicated on one disc and hundreds of kHz are indicated on the other disc.

DRAKE SPR-4 SPECIFICATIONS

Frequency Coverage: Can be programmed with accessory crystals for 23 ranges (each tuning a 500 kHz band) from 0.5 to 30 MHz plus 150 to 500 kHz. Crystals supplied with the receiver allow coverage on these ranges: 150-500 kHz, 0.5-1.0 MHz, 1.0-1.6 MHz*, 6.0-6.5 MHz, 7.0-7.5 MHz, 9.5-10 MHz, 11.5-12 MHz, 15-15.5 MHz, 17.5-18 MHz, 21.5-22 MHz.

Modes of Operation: A-m, cw, lsb, usb, (RTTY with RY-4 accessory installed).

Selectivity: A-m: 4.8 kHz @ -6 dB, 10 kHz @ -60 dB. Ssb: 2.4 kHz @ -6 dB, 7.2 kHz @ -60 dB. Cw: 0.4 kHz @ -6 dB, 2.7 kHz @ -60 dB.

Intermediate Frequencies: 1st i-f 5645 kHz four pole crystal lattice filter, 2nd i-f 50 kHz four pole Hi-Q Ferrite LC filter.

Frequency Stability: At room temperature, drift for all causes (including ± 10% change in supply voltage) is less than ± 100 Hz.

Sensitivity: Ssb and cw: 0.25 microvolt for 10 dB S+N/N, a-m: 0.5 microvolt with 30% modulation for 10 dB S+N/N.

Image Rejection: Greater than 60 dB below 15 MHz. Greater than 50 dB above 15 MHz.

Blocking: An undesired unmodulated signal at least 20 kHz above or below a desired signal of .25 microvolt must be 90 dB stronger than the .25 microvolt signal to cause a 3 dB reduction of the signal to noise ratio of the desired signal.

Cross Modulation: An unwanted signal (modulated 30% at 1 kHz) removed by at least 20 kHz from a desired signal of 1 microvolt, must have a signal level of at least 10 millivolts to produce a noticeable crossmodulation of the desired signal.

Intermodulation: Using a reference signal of .25 microvolt, two interfering signals of equal strength within the passband of the receiver front-end selectivity must each have a strength of at least 65 dB above the reference signal to produce third order products equal to the .25 microvolt reference signal.

Automatic Gain Control: Agc is used on a-m, cw, and ssb. Time constants are selected for the optimum effectiveness on each mode. Audio output is held constant to 6 dB over a 100 dB range of input signals. Jumper wire allows choice of fast or slow release on cw.

Input Impedance: 50 ohms approximately (high impedance 150 kHz to 1500 kHz)

Excessive Rf Input Voltage Protection: Withstands 30 volts rms from a 50 ohm generator continuously.

Output Power: 3 watts into 4 ohm load (less into higher impedance loads).

Power Consumption: 18 watts on 120 V-ac or 5¾ watts on 12 V-dc, 2.5 watts on 12 V-dc with dial lights turned off and with audio output adjusted for normal listening level.

Calibration: Dial is accurate to better than ± 1 kHz when calibrated at nearest 100 kHz calibration point.

Hum and Noise: More than 60 dB below rated output.

Size and Weight: 5.5″H x 10.8″W x 12.3″D (14 x 27.4 x 31.2 cm), 18 lbs (8.2 kg).

**Generous overtravel gives additional 50 kHz or more off each end of range.*

ACCESSORIES

Matching Speaker: Same size as SPR-4, has 5 x 7 speaker. Model No. 1511 Drake MS-4.

Calibrator: Plug-in 100 kHz crystal oscillator with harmonics that occur at 100 kHz intervals throughout the range of SPR-4. Model No. 1223 Drake SCC-4.

Noise Blanker: Plug-in i-f type noise blanker mutes receiver for duration of each noise pulse. 16 transistors, 2 diodes. Model No. 1227 Drake 5-NB.

Loop Antenna: Directional antenna nulls out undesired stations, plugs into receptacle through top of the cabinet, operates from 150 kHz to 1600 kHz only. Model No. 1235 Drake AL-4.

Antenna Kit: Consists of wire, insulators, lead-in, and instructions. Model No. 1237 Drake AN-5.

Dc Power Cord: Plugs into cigar lighter in an automobile, allows SPR-4 to be used on 12 volts dc supply. Model No. 1229 Drake DC-PC.

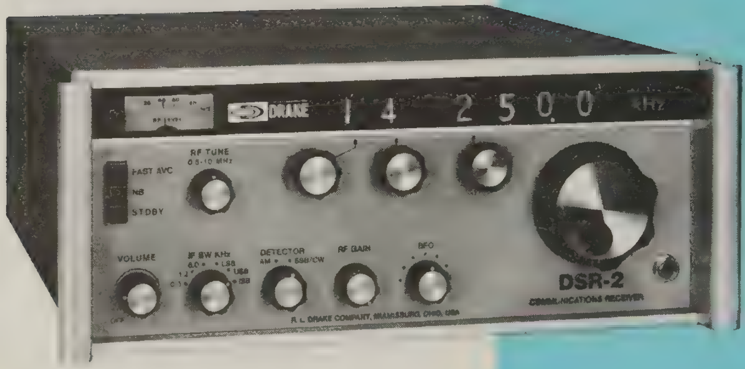
Teletype Adapter: Allows reception of standard teletype tones 2125/2975 Hz and 2125/2295 Hz by remote shifting BFO. Model No. 1225 Drake RY-4.

Transceive Adaptor: Allows SPR-4 to transceive with all T-4 and T-4X Transmitters. Consists of printed circuit board and connectors. Model No. 1224 Drake TA-4.

Headphone: Model No. 7078 Drake HS-1.

Model No.
1242

Drake DSR-2



- **Continuous Coverage 10 kHz to 30 MHz**
- **Digital Synthesizer Frequency Control**
- **Frequency Displayed to 100 Hz**
- **All Solid State**
- **A-m, Ssb, Cw, RTTY, Isb**
- **Series Balanced Gate Noise Blanker**
- **Front End Protection**
- **Optional Features Available on Special Order**

The R. L. Drake Model DSR-2 Receiver is a high grade communications receiver employing the most up-to-date solid state devices and circuitry. It provides continuous coverage from 10 kHz to 30 MHz. The received frequency is displayed on six nixie tubes to the nearest 100 Hz.

Frequency injections of the DSR-2 are controlled by a phase-locked digital synthesizer which allows incremental frequency selection in 10, 1, and 0.1 MHz steps. The remaining 0 to 0.1 MHz is continuously adjustable by a highly stable variable oscillator controlled from the fine tuning knob on the front panel. Modular construction on easily accessible printed circuit boards is used throughout the DSR-2. Extensive use of dual gate MOSFET transistors in the DSR-2 circuitry contributes to its superior intermodulation, avc, wide dynamic range and overload performance.

The front panel controls allow the operator to select frequency (with fine tune control), a-m or ssb product detector, i-f bandwidth, af gain, BFO pitch, fast or slow avc, manual rf gain, standby position, and the highly effective Drake series gate noise blanker. Isb (Independent Sideband) is a built-in feature of the DSR-2. Separate i-f crystal filter, i-f amplifier, and audio output circuits allow two simultaneous communication channels to be employed on one frequency assignment, doubling the information receiving capacity.

Front-end protection includes special circuitry built-in to provide protection against transmitters

in close proximity. It will withstand a 30 volt emf from a 50 ohm source, with the receiver on or off.

The normal avc system has appropriate attack and decay times to provide proper clean reception of ssb and cw signals. This avc system operates on both the rf and i-f circuitry to provide reception free of 'popping.' The rf avc provides an additional control under very strong signal conditions to increase the dynamic range. Front panel controls are available to decrease the decay time of the avc circuitry, to disconnect the avc circuitry and to provide manual control.

DRAKE DSR-2 SPECIFICATIONS

Frequency Range: 10 kHz to 30 MHz continuous range.

Modes of Operation: Usb, lsb, cw, RTTY, a-m, isb.

Frequency Readout: Complete to 100 Hz on six Nixie tubes.

Frequency Selection: 10 MHz, 1 MHz, 0.1 MHz steps switch selected. 0 to 0.1 MHz continuously variable.

Frequency Stability: Frequency drift does not exceed 200 Hz in any 8 hour period at constant ambient temperature between 0° and 40°C and ± 10% variation from nominal line voltage after ½ hour warmup.

Sensitivity: 0.01—0.5 MHz: Less than 4 microvolts for 10 dB SINAD at 2.4 kHz ssb mode. Less than 25 microvolts for 10 dB SINAD at 6 kHz a-m mode with 30% modulation. 0.5—30 MHz: Less than 0.3 microvolts for 10 dB SINAD at 2.4 kHz ssb mode. Less than 2 microvolts for 10 dB SINAD at 6 kHz a-m mode with 30% modulation.

Image Rejection: Greater than 60 dB relative to 1 microvolt below 10 MHz. Greater than 50 dB relative to 1 microvolt above 10 MHz.

I-f rejection: Greater than 60 dB relative to 1 microvolt except in range of 4.5 to 5.5 MHz.

Rf Blocking: Greater than 100 dB relative to 1 microvolt.
*Desired signal at 60 dB above 1 microvolt with a blocking signal removed 20 kHz and its amplitude adjusted to reduce desired signal 3 dB.

Crossmodulation: 70 dB relative to 1 microvolt.
*Desired signal at 60 dB above 1 microvolt with undesired signal removed 20 kHz and its amplitude adjusted for crossmodulation products 30 dB lower than desired signal.

Intermodulation: 70 dB relative to 1 microvolt.
*Level of two undesired signals, removed at least 30 kHz from the desired frequency, required to produce the equivalent audio output as desired signal 30 dB greater than 1 microvolt.

Opposite Sideband Suppression: Greater than 60 dB at 500 Hz into the opposite sideband.

I-f Bandwidth (in kHz):

Selectivity	**−6 dB**	**−60 dB**
6	6	11.5
2.4	2.4	4.3
1.2	1.2	2.4
0.3	0.3	0.6

Optional filters available for other bandwidths.

Automatic Volume Control: Audio output increases less than 3 dB for an rf input change of 100 dB.

Attack Time	1 millisecond
Release Time: (normal avc)	1 second
(fast avc)	100 milliseconds

Antenna Input Impedance:

10 kHz to 500 kHz	1000 ohms
500 kHz to 30 MHz	50 ohms

Antenna Input Protection: The receiver has built-in protection to prevent damage from a 30 volt signal applied to the antenna for a 15 minute period.

Audio Output: Communications channel: 2 watts at 5% maximum distortion into 4 ohm load (4 ohms unbalanced). 1 milliwatt into 600 ohm load (600 ohms balanced and center tapped). Isb channel: 1 milliwatt into 600 ohm load (600 ohms balanced and center tapped).

Audio Hum and Noise: Greater than 60 dB below rated output.

BFO: Derived from 5 MHz standard oscillator, or variable over a ± 3 kHz range from front panel control.

Power Requirements: 120/240 volts ± 10% single phase 50 to 420 Hz, 35 watts.

Dimensions: 5.5″H x 13.4″W x 15″D (14 x 34 x 38 cm).

Weight: 17 lbs (7.7 kg).

**Measurement Procedure*

1211

Drake R-4C

Solid State Linear permeability-tuned VFO with 1 kHz dial divisions. Gear driven dual circular dials. High mechanical, electrical and temperature stability.

Covers ham bands with crystals furnished. Covers all of 80, 40, 20 and 15 meters, and 28.5-29.0 MHz of 10 meters.

Covers 160 meters with accessory crystal. In addition to the ham bands, tunes any fifteen 500 kHz ranges between 1.5 and 30 MHz, 5.0 to 6.0 MHz not recommended. Can be used for MARS, WWV, CB, Marine and Shortwave broadcasts.

Superior selectivity: 2.4 kHz 8-pole filter provided in ssb positions. 8.0 kHz, 6 pole selectivity for a-m. Optional 8-pole filters of .25, .5, 1.5 and 6.0 kHz bandwidths available.

Tunable notch filter attenuates carriers within passband.

Smooth and precise passband tuning.

Transceive capability; may be used to transceive with the T-4X, T-4XB or T-4XC Transmitters. Illuminated dial shows which PTO is in use.

Usb, lsb, a-m and cw on all bands.

Agc with fast attack and two release times for ssb and a-m or fast release for break-in cw. Agc also may be switched off.

New high efficiency accessory noise blanker that operates in all modes.

Crystal lattice filter in first i-f prevents cross-modulation and desensitization due to strong adjacent channel signals.

Excellent overload and intermodulation characteristics.

25 kHz Calibrator permits working closer to band edges and segments.

Scratch resistant epoxy paint finish.

DRAKE R-4C SPECIFICATIONS

Frequency Coverage: 3.5-4.0 MHz, 7.0-7.5 MHz, 14.0-14.5 MHz, 21.0-21.5 MHz and 28.5-29.0 MHz with crystals supplied. Fifteen accessory crystal sockets are provided for coverage of any 15 additional 500 kHz ranges between 1.5 and 30.0 MHz with the exception of 5.0-6.0 MHz.

Selectivity: Ssb—2.4 kHz at 6 dB down, 4.2 kHz at 60 dB down. A-m—8.0 kHz at 6 dB down, 28.0 kHz at 60 dB down. Filters with 0.25, 0.5, 1.5 and 6.0 kHz bandwidths at the −6 dB points are available for the cw1, cw2 and a-m modes. Product detection is used in the ssb, cw1 and cw2 modes; diode detection is used in the a-m mode. Agc switching is independent of mode switching.

I-f Frequencies: First i-f 5645 MHz wth 4-pole crystal filter. **Second** i-f 5695 MHz with 8-pole cyrstal lattice filter, and **third** i-f is 50 kHz with 2 LC tuned circuits.

Stability: Less than 100 Hz after warm-up. Less than 100 Hz for 10% change in line voltage.

Sensitivity: Less than 0.25 μV for 10 dB signal plus-noise-to-noise on all amateur bands. Less than 0.5 μV at any frequency.

Modes of Operation: Ssb, cw, a-m, RTTY, SSTV.

Dial Calibration: Main dial is calibrated from 0 to 500 kHz in 1 kHz increments. Calibration Accuracy: Better than 1 kHz when calibrated to the nearest 100 kHz point. Markers are at 25 kHz for greater accuracy.

Automatic Gain Control: Amplified agc has fast attack (less than 1 ms) and 3 selectable release times. Slow release is 1.0 second, medium release is 350 ms, and fast release is 50 ms. Audio output increases not more than 3 dB for 100 dB rf input change. (1 μV to 0.1 volt).

Audio Ouput: At least 2.0 watts into a 3.2 ohm load. 3000 ohm output available for anti-VOX.

Antenna Input Impedance: 52 ohms nominal.

Spurious Repsonses: Image rejection more than 70 dB; i-f rejection more than 70 dB on amateur ranges. Internal spurious ranges in amateur bands less than the equivalent of the 1 μV signal at the antenna.

Power Consumption: 60 watts, 120/240 V-ac, 50 to 400 Hz.

Dimensions: 5.5″H x 10.8″W x 11.7″ cabinet depth, 12.8″ overall depth (14 x 27.3 x 32.4 cm).

Weight: 17 lbs (7.7 kg).

CONTROLS AND JACKS

Front Panel: Main tuning, agc switch, passband tuning, notch filter, mode switch, function switch, preselector tuning, af and rf gain controls, bandswitch, accessory crystal switch and headphone jack.

Rear Panel: S-meter zero control, crystal filter sockets, auxiliary crystal sockets, accessory power socket, 120/240 V-ac power switch, line fuse, carrier oscillator jack, antenna jack, speaker jack, mute jack, anti-VOX/sidetone jack, PTO lamp jack and transmitter carrier oscillator jack.

C-Line Accessories

Model No. 1511

Drake MS-4 Matching Speaker

(Shown on facing page) for use with R-4, R-4A, R-4B and R-4C Receivers. (Has space to house AC-3 and AC-4 Power Supplies).

Power Supplies for T-4, T-4X, T-4XB or T-4XC (The AC-4 can be housed in an MS-4 speaker cabinet).
Model No. 1501 Drake AC-4
Model No. 1505 Drake DC-4

Accessory Bandwidth Filters available: Model No. 7011 Drake FL250, Model No. 7013 Drake FL500, Model No. 7015 Drake FL1500, Model No. 7017 Drake FL4000, Model No. 7019 Drake FL6000.

Linear Amplifier see page 15
RF Wattmeters see page 3
Matching Networks and FS-4 Synthesizer see page 14
Push Button Encoding Mike see page 20

DRAKE MICROPHONES

Wired for use with Drake transmitters and transceivers, for either push-to-talk or VOX. Type of operation is determined by the VOX control setting of the transmitter.

Desk Type Model No. 7075

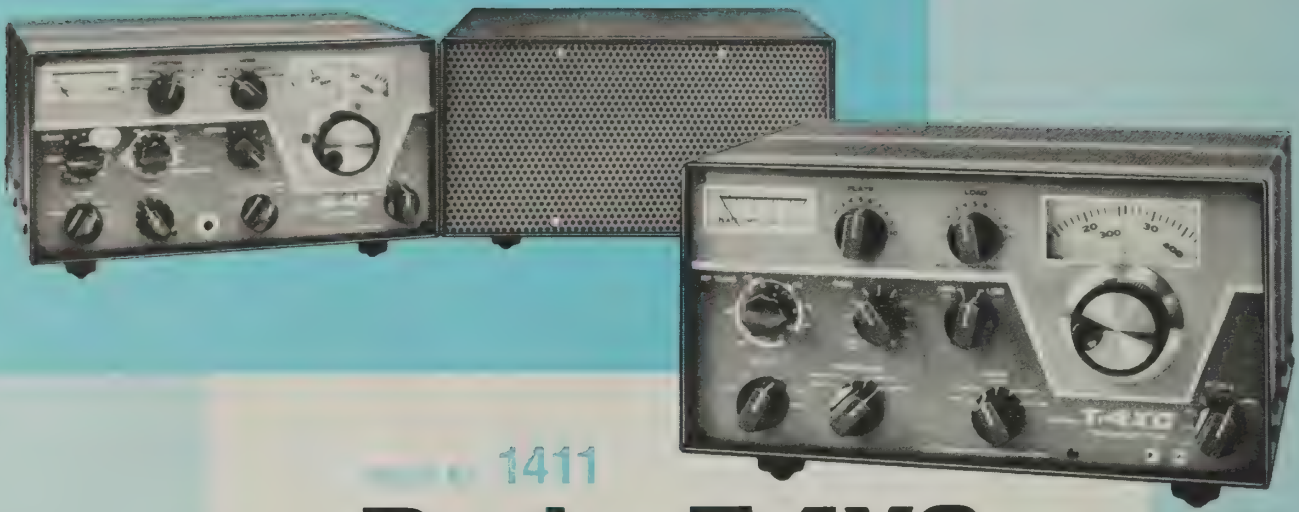
• **Type:** Heavy Duty Ceramic Desk Top • **Cable:** Four Foot, 3-Conductor, One Shield • **Output Level:** Minus 54 dB (0 dB = 1 volt/microbar) • **Frequency Response:** 80-7000 Hz • **Switching:** Adapts to either push-to-talk or VOX.

Hand-Held Type Model No. 7072

• **Type:** Ceramic, hand held • **Cable:** 11″ Retracted, 5′ extended, PVC 3 Cord, 1 shielded, Coil Cord • **Case:** Cycolac • **Finish:** Grey • **Output Level:** Minus 65 dB (0 dB = 1 volt/microbar) • **Frequency Response:** 300-3000 Hz • **Switching:** Adapts to either push-to-talk or VOX.

DRAKE®

C-Line Amateur Transmitter



[illegible] 1411

Drake T-4XC

Solid State Linear permeability-tuned VFO with 1 kHz dial divisions. Gear driven dual circular dials. High mechanical, electrical and temperature stability.

Covers ham bands with crystals furnished. Covers all of 80, 40, 20 and 15 meters, and 28.5-29.0 MHz of 10 meters.

Covers 160 meters with accessory crystal. Four 500 kHz ranges in addition to the ham bands plus one fixed-frequency range can be switch-selected from the front panel.

Two 8-pole crystal lattice filters for sideband selection.

Transceives with the R-4, R-4A, R-4B, R-4C and SPR-4 Receivers. Switch on the T-4XC selects frequency control by receiver or transmitter PTO or independently. Illuminated dial shows which PTO is in use.

Usb, lsb, a-m and cw on all bands.

Controlled-carrier modulation for a-m is compatible with ssb linear amplifiers.

Automatic transmit-receive switching. Separate VOX time-delay adjustments for phone and cw. VOX gain is independent of microphone gain.

Choice of VOX or PTT. VOX can be disabled by front panel switch.

Adjustable pi network output.

Transmitting agc prevents flat-topping.

Meter reads relative output or plate current with switch on load control.

Built-in cw sidetone.

Spotting function for easy zero-beating.

Easily adaptable to RTTY, either fsk or afsk.

Compact size; rugged construction. Scratch resistant epoxy paint finish.

DRAKE T-4XC SPECIFICATIONS

• **Frequency Coverage:** 3.5-4.0 MHz, 7.0-7.5 MHz, 14.0-14.5 MHz, 21.0-21.5 MHz and 28.0-28.5 MHz with crystals supplied. Four accessory crystal sockets are provided for additional 500 kHz ranges between 1.8 and 30.0 MHz, excluding 2.3-3.0 MHz, 5.0-6.0 MHz and 11.0-12.0 MHz. Crystals for fixed-frequency operation may be plugged into a front-panel socket for use between 1.8 and 30.0 MHz, excluding 2.3-3.0 MHz, 5.0-6.0 MHz and 10.5-12.0 MHz. • **Dial Calibration:** Main dial is calibrated from 0 to 500 kHz in 1 kHz increments. Calibration Accuracy: Better than 1 kHz when calibrated to the nearest 100 kHz point. • **Stability:** Less than 100 Hz after warm up. Less than 100 Hz with 10% change in line voltage. • **Modes of Operation: Ssb:** Upper or lower sideband on all bands. VOX or Push-to-talk. • **Cw:** Grid-block keying. VOX circuit is keyed for automatic transmit-receive switching. Sidetone oscillator is keyed for monitoring. Shifted carrier system has no spurious outputs. • **A-m:** Controlled-carrier a-m modulation system is built in. This system is compatible with ssb linear amplifiers. VOX or push-to-talk. • **RTTY:** Two methods of RTTY are available. **1.** The VFO is easily adaptable to fsk. Signal frequency shifts the same direction on all bands and the same amount on any band with a given dial setting. **2.** The RTTY signal also may be generated by applying undistorted audio tones at the mike input in the ssb mode. A jack is provided at the rear panel to shift the carrier oscillator frequency by an amount that, in the lsb position, the frequency bandpass through the sideband filter is shifted so that the tones of 2125 and 2975 Hz will pass with equal amplitude. • **Sideband Suppression:** 60 dB or better. Carrier Suppression: 60 dB or better. • **Average Distortion Products:** at least 30 dB down. • **Frequency Response:** 350 to 2750 Hz at 6 dB down. • **Input Power:** Ssb and a-m—200 watts PEP, cw—200 watts. • **Output Impedance:** Nominal 52 ohms adjustable with pi network. (SWR should be 2:1 or less). • **Microphone Input:** High impedance. • **Agc:** Operates on ssb to prevent flat-topping due to overdrive. • **Power Requirements:** (Provided by AC-3 and AC-4 power supplies). 650 volts dc at 200 mA average and 330 mA maximum with better than 10% regulation from 50 mA to 330 mA and maximum ripple of less than 1%. 250 volts dc at 120 mA with 10% regulation from 82 mA to 120 mA. This includes the effect of the 650 volt supply change if both voltages are obtained from the same transformer. Maximum ripple must be less than ¼%. Also −45 to −65 volts dc adjustable filtered bias into a 33 k ohm load, and 12.6 volts ac or dc at 3 amps. • **Dimensions:** 5.5″H x 10.8″W x 11.7″ cabinet depth, 12.8″ overall depth (14 x 27.3 x 31.4 cm). • **Weight:** 14.6 lbs (6.6 kg).

CONTROLS AND JACKS:

• **Front:** Main tuning, accessory crystal switch, mode switch, sideband selector, band switch, transceive switch, rf tune, microphone gain, plate tuning, plate loading control with relative output swtich, and fixed-frequency crystal socket. • **Rear:** Power connector, mute jack, receiver antenna jack, antenna connector, anti-VOX/sidetone jack, receiver injection jack, RTTY carrier oscillator shift jack, carrier oscillator output jack, PTO lamp jack, microphone jack, key jack, anti-VOX/sidetone gain control, VOX gain control, VOX delay control-cw, and VOX delay control-ssb a-m.

C-Line Accessories

Model No. 1511

Drake MS-4 Matching Speaker

(Shown on facing page) for use with R-4, R-4A, R-4B and R-4C Receivers. (Has space to house AC-3 and AC-4 Power Supplies).

Power Supplies for T-4, T-4X, T-4XB or T-4XC (The AC-4 can be housed in an MS-4 speaker cabinet).
Model No. 1501 Drake AC-4
Model No. 1505 Drake DC-4

Accessory Bandwidth Filters available: Model No. 7011 Drake FL250, Model No. 7013 Drake FL500, Model No. 7015 Drake FL1500, Model No. 7017 Drake FL4000, Model No. 7019 Drake FL6000.

Linear Amplifier see page 15
RF Wattmeters see page 3
Matching Networks and FS-4 Synthesizer see page 14
Push Button Encoding Mike see page 20

DRAKE MICROPHONES

Wired for use with Drake transmitters and transceivers, for either push-to-talk or VOX. Type of operation is determined by the VOX control setting of the transmitter.

Desk Type Model No. 7075

• **Type:** Heavy Duty Ceramic Desk Top • **Cable:** Four Foot, 3-Conductor, One Shield • **Output Level:** Minus 54 dB (0 dB = 1 volt/microbar) • **Frequency Reponse:** 80-7000 Hz • **Switching:** Adapts to either push-to-talk or VOX.

Hand-Held Type Model No. 7072

• **Type:** Ceramic, hand held • **Cable:** 11″ Retracted, 5′ extended, PVC 3 Cord, 1 shielded, Coil Cord • **Case:** Cycolac • **Finish:** Grey • **Output Level:** Minus 65 dB (0 dB = 1 volt/microbar) • **Frequency Response:** 300-3000 Hz • **Switching:** Adapts to either push-to-talk or VOX.

DRAKE® C-LINE ACCESSORIES

The new solid state Drake FS-4 Synthesizer opens the door to a new world of continuous-tuning short wave! Combines synthesized general coverage flexibility with the selectivity, stability, frequency readout and reliability of the Drake R-4C or SPR-4 Receivers.

Model No. 1520

Drake FS-4 Digital Synthesizer

• Interfaces with all R-4 series receivers and T-4X series transmitters: (R-4, R-4A, R-4B, R-4C, SPR-4, T-4, T-4X, T-4XB and T-4XC), without modification. • MHz range is set on FS-4, with kHz readout taken from receiver dial. • Complete general coverage—no range crystals to buy. • T-4/T-4X series transmitters transceive on any FS-4 frequency, when used with R-4 series receivers. • Readout 1 kHz with Drake PTO.

R-4C/FS-4: • Passband Tuning, Notch Filter, optional Selectable 8-pole Crystal Filter for optimum selectivity. • Continuous coverage 1.5 MHz through 30 MHz.

SPR-4/FS-4: • All solid state • Built-in L/C Filter for selectivity on am, cw, usb and lsb. • Versatile combination includes low frequency Marine and Broadcast band. • Continuous coverage 150 kHz-30 MHz. • For use with SPR-4, order Interface Kit Model 1523.

Model No's 1507 & 1509

Drake MN-4 & MN-2000 Matching Networks

MN-4 (Model No. 1507)

MN-2000 (Model No. 1509)

A Drake matching network is a worthwhile addition to any amateur station where peak performance is desired. Basically identical, except for power handling capabilities, the MN-4 and MN-2000 enable feedline SWR's of 5:1 to be matched to the transmitter. If input impedance is purely resistive, even higher SWR's can be handled. • Besides presenting a 50 ohm load to the transmitter, the Matching Network's built in rf wattmeter allows accurate and continuous power measurement and VSWR indication. The advanced wattmeter circuitry yields frequency-insensitive readings from 2 to 30 MHz, and accuracy until now obtainable only in expensive wattmeters.

DRAKE MN-4 & MN-2000 SPECIFICATIONS

Frequency Coverage:	3.5 to 4.0 MHz, 7.0 to 7.3 MHz, 14.0 to 14.35 MHz, 21.0 to 21.45 MHz, 28.0 to 29.7 MHz	
Input Impedance:	50 ohms (resistive)	
Load Impedance:	50 ohm coax with VSWR of 5:1 or less (any impedance angle) 75 ohm coax at a lower VSWR can be used.	
Meter:	Reads forward power in watts, or VSWR	
Insertion Loss:	0.5 dB or less on each band after tuning	
	MN-4	**MN-2000**
Power Capability:	200 watts rf continuous	1000 watts rf average continuous duty, 2000 watts PEP
Wattmeter Accuracy:	± (5% of reading + 1% of full scale)	
Dimensions: (including connectors)[2]	5.5″H x 10.8″W x 8.5″D (14 x 27.3 x 21.6 cm)	5.5″H x 10.8″W x 14.4″D (14 x 27.3 x 36.5 cm)
Shipping: Weight: Dimensions:	9 lbs (4.1 kg) 11.8″ x 8″ x 10.3″ (29.8 x 20.3 x 26 cm)	18 lbs (8.2 kg) 18″ x 9″ x 15″ (45.7 x 22.9 x 38.1 cm)
FRONT PANEL CONTROLS	Resistive Tuning, Reactive Tuning, VSWR Calibration, Bandswitch, Watts/VSWR Selector Switch	
	—	Antenna/Dummy Load Switch
REAR PANEL	Ground Post and three SO-239 Connectors: one input, two outputs	Ground Post and four SO-239 connectors: One input, two outputs, one Alternate Antenna/Dummy Load

(Other C-Line Accessories: see page 11.)

Model No. 1519

Drake L-4B Linear Amplifier

• **2000 watts PEP ssb—1000 watts dc input power on cw, a-m, and RTTY.** Massive plate transformer, large heavy duty plate tank components and voluminous cooling system insure continuous operation at these ratings. • **High-efficiency Class B Grounded Grid Circuit** uses the new Eimac 3-500Z zero bias triodes. These tubes have a total plate dissipation rating of 1000 watts and their rugged construction withstands abuse. • **A broadband tuned input circuit** is employed on each band for minimum distortion, higher efficiency and a 50 ohm input impedance. • **Vernier Drive** on the plate tuning control for easy plate tuning. • **New Epoxy Finish** and eye-ease front panel. • **The L-4B Linear Amplifier matches TR-4 series transceivers and T-4 and T-4X series transmitters** in appearance and drive requirements to run the maximum legal input power. Any exciter that can deliver 100 watts PEP ssb and 75 watts on cw will be able to drive the L4B to the maximum legal input power. An advantage of the grounded grid circuit is that most of the driving power adds to the output power. • **Two taut-band suspension meters** indicate plate current, grid current, plate voltage, forward and reflected r-f power. The plate current meter time constant is consistant with FCC regulations. • **A transmitting agc circuit** controls the exciter gain to allow the highest average power without peak clipping. A front panel adjustment is provided to set the threshold level for optimum operation of different exciters. • **A standby switch** on the L4B allows the L4B to remain "On" while operating with the exciter only. • **Rf negative feedback** decreases distortion to better than 35 dB and tends to equalize tube characteristics from tube to tube and from brand to brand. • **Built-in rf directional wattmeter** calibrated 300 and 3000 watts forward and 300 watts reflected. • **An internal changeover relay** feeds the antenna through when on "Receive", "Standby", or when power is off. A pair of relay contacts bias the output tubes to cutoff, eliminating unwanted heat and diode noise when receiving. • **A quiet, internal blower**—low velocity, high volume. Effectively cools tube base seals, envelopes, and plate seals.

• **L-4B includes tubes, chimneys and a solid state power supply** which provides excellent dynamic and static voltage regulation. The power supply is separate to keep the weight off the operating desk and to make a more flexible installation.

DRAKE L-4B SPECIFICATIONS

• **Frequency Coverage**—Ham bands 80 through 10 meters. All frequencies 3.5 to 30 MHz may be covered with alteration of input coils. • **Plate Input**—2000 watts PEP—ssb, 1000 watts dc on cw, a-m and RTTY. • **Drive Requirements**—100 watts PEP—ssb, 75 watts cw, a-m and RTTY. • **Input Impedance**—50 ohms. • **Output Impedance**—Adjustable pi-network matches 50 ohm line with SWR not to exceed 2:1. • **Wattmeter Accuracy**—300 watts forward and reflected, ± (5% of reading + 3 watts). 3000 watts forward, ± (5% of reading + 30 watts). • **Power Requirements**—230 volts 50—60 cycles 15 amperes, or 115 volts 50—60 cycles 30 amperes. • **Dimensions—Amplifier** 14″W x 7.9″H x 14.4″D (35.4 x 20 x 36.4 cm), **Power Supply** 6.8″W x 7.9″H x 11″D (17.1 x 20 x 27.9 cm). • **Weight—Amplifier** 32 lbs (14.5 kg), **Power Supply** 43 lbs (19.5 kg). • **Tube Complement**—Two 3-500Z (Two 8163 or Two 3-400Z can be used). • **Shipping Wt & Size: Power Supply** 48 lbs (21 kg), 11.5″ x 11″ x 13.5″ (29.2 x 27.9 x 34.3 cm); **Amplifier** 42 lbs (19.1 kg), 21″ x 12″ x 17″ (53.3 x 30.5 x 43.2 cm).

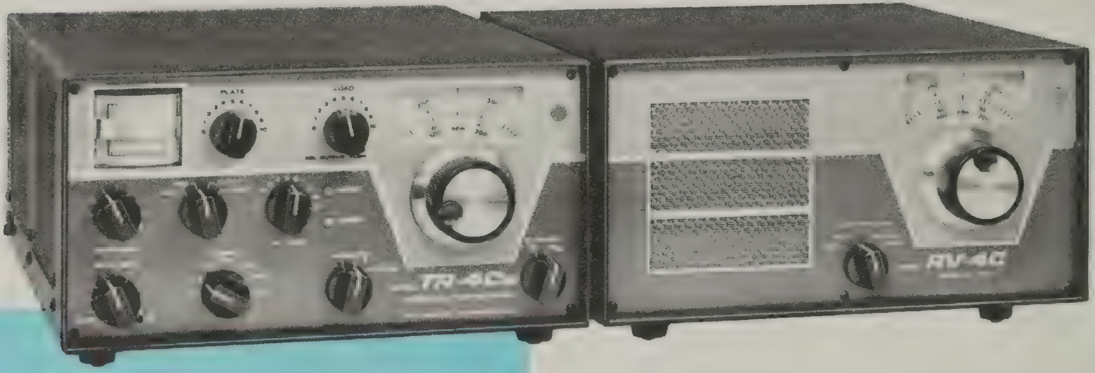
FRONT PANEL CONTROLS

• **On-Off**—Rocker Switch. • **Ssb-Cw/Tune**—Rocker switch changes plate voltage for different modes of operation. • **Band**—Switch selects desired ham bands (See Frequency Coverage). • **Plate and Load**—Tuning adjust pi-network capacitors in tank circuit for proper resonance and loading on all bands. • **Meter**—Switch selects monitoring either grid current, plate voltage, forward or reflected rf power on the lower meter. • **Alc/Standby Push**—Transmitting agc threshold adjustment and push-pull switch that allows the L-4B to remain on while operating with the exciter only. • **Rear Jacks**—Power (connects L-4B to power supply), high voltage, VOX (for turning on L-4B with exciter VOX contacts), transmitting agc (for connecting transmitting agc to exciter), rf input (for connecting to exciter rf output), rf output (for connecting L-4B to an antenna). • **Meters**—Plate Current, Grid Current/Plate Voltage/Forward Power/Reflected Power (switch selected). • **Power Supply Controls**—Two circuit breaker reset buttons.

[illegible]

Drake TR-4Cw Sideband/Cw Transceiver

with Model No. 1319 Drake RV-4C Remote VFO



The Transceiver for All License Classes

- **500 Hz cw filter now included**
- **Ideal for the licensee in the up-graded Novice/Technician Class.**
- **Runs the full 250 watt cw input.**
- **80 thru 10 meters**
- **1 kHz dual concentric dial**
- **Excellent PTO stability**
- **Full gating noise blanker optional**
- **Transceive or separate PTO**
- **Wide range receiving agc**
- **Calibration constant mode to mode**
- **300 watts PEP input on ssb**
- **Shifted-carrier cw**
- **Upper and lower sideband**
- **Superb receiver overload and Cross-Mod characteristics**
- **VOX or PTT**
- **Output impedance adjustable**

The many years of transceiver experience and design improvements behind the Drake TR-4Cw make it one of the finest transceivers available in both circuit design and packaging. Compact and lightweight, it is ideal for mobile use, portable excursions, and vacations. Usb, lsb, cw, or a-m operations is at your finger tips.

• **300 Watts PEP** input on ssb, 260 watts input on cw. • **Complete Amateur Band Frequency Coverage:** 80 through 15 meter bands complete and 28.5-29.1 MHz of 10 meters. Rest of 10 meter band obtained with accessory crystals. • **Separate Sideband Filters:** Separate usb and lsb filters eliminate oscillator shifting and insure long term carrier vs filter alignment. • **Nominal 1.7:1 Filter Shape Factor:** These filters stand among the industry's finest with 6dB bandwidth of 2.1 kHz (chosen to slice thru QRM), 60 dB bandwidth of only 3.6 kHz and 100 dB ultimate rejection. • **Provision For Highly Effective Accessory Noise Blanker.** • **Heavy Irridited Cadmium Plated Chassis.** • **Cw Side Tone Oscillator** for monitoring your cw transmission. • **Finish:** Scratch resistant epoxy paint. • **Crystal Calibrator** built in. • **VFO Indicator Light** eliminates confusion of which main tuning knob controls the frequency when using an RV-4C remote VFO. • **Automatic Cw Transmit Receive Switching** sometimes called "semi" break-in. • **Full Agc** with Drake dual time constant system confines a 60 dB signal change to a 3 dB audio change. • **Effective Transmitting Agc** insures clean ssb output. • **Solid State Permeability Tuned VFO** for low drift and accurate 1 kHz divisions on all bands. New easy to read dual concentric dials. • **VOX or PTT** for use on a-m or ssb. • **Receiver S-Meter** automatically switches to indicate transmitting agc on transmit. • **Transmitter Plate Ammeter** indicates **Relative Rf Output** by depressing load control shaft. • **Adjustable Pi-Network** output circuit.

DRAKE TR-4Cw SPECIFICATIONS

• **Frequency Coverage:** Full coverage on all amateur bands 10 thru 80 meters, in seven 600 kHz ranges, with crystals supplied: 3.5 to 4.1 MHz, 7.0 to 7.6 MHz, 13.9 to 14.5 MHz, 21.6 MHz, 28.5 to 29.1 MHz. Accessory crystals available for 28-28.6 and 29.1-29.7 ranges. • **Solid State VFO:** Has linear permeability tuning. Tunes 4.9 to 5.5 MHz for all ranges. • **Dial Calibration:** New concentric dials. 100 kHz markings on one dial, 1 kHz division on second dial. • **Frequency Stability:** High stability solid state VFO tunes same range on all bands. Drift is less than 100 Hz after warm-up, and less than 100 Hz for plus or minus 10% line voltage change. • **Modes of Operation:** Ssb upper and lower sideband, cw and a-m. • **Power Supply Requirements:** Due to the 300 watt, PEP input rating, the TR-4Cw requires a power supply capable of low voltage at high current with very good dynamic regulation. The voltage and current requirements are as follows: 1. 650 volts at 300 mA average and 500 mA maximum with 10% regulation from 100 mA to 500 mA and maximum ripple of less than 1%. 2. 250 volts at 175 mA with 10% regulation from 150 mA to 180 mA. This includes the effect of the 650 volt supply change if both voltages are obtained from the same transformer. Maximum ripple must be less than ¼%. 3. −45 to −65 V-dc adjustable filtered bias into 33K ohm load. 4. 12.6 volt ac or dc at 5.5 amps. • **Misc:** 20 tubes including voltage regulator; two transistors; 8 diodes; 100 kHz crystal calibrator built in; **Dimensions:** 5.5″H x 10.8″W x 14.4″D (13.9 x 27.3 x 36.5 cm). **Weight:** 16 lbs (35.2 kg). **Shipping:** Dimensions; 18″ x 9″ x 15″ (45.7 x 22.9 x 38.1 cm). Weight; 21 lbs (46.2 kg).

TRANSMITTER SPECIFICATIONS:

• **Single Sideband.** 300 watts PEP input power, VOX or PTT. Two special 9 MHz crystal filters provide upper or lower sideband selection on any band, without the necessity of shifting oscillators. Unwanted sideband suppression of more than 60 dB and carrier suppression of 60 dB. Overall audio frequency response 400 to 2500 hertz at 6 dB down. Distortion products 30 dB down from maximum output. • **Cw: Power input 260 watts.** Carrier is shifted approximately 1000 hertz into one sideband, and mixer and driver are keyed. Grid block keying is free from chirps and clicks. Automatic transmit/receive switching when key is operated. Cw sidetone oscillator for monitoring. • **A-m:** Controlled carrier a-m screen modulator is built-in. 260 watts PEP input. Low carrier power increases 6 times to 50 watts output at maximum modulation. This system is compatible with ssb linears. VOX or PTT. A diode envelope detector is used in this mode. Product Detector can be used by switching manually. • **Output Impedance:** Nominal 50 ohms, adjustable with pi-network. • **Microphone Input:** High-impedance.

RECEIVER SPECIFICATIONS:

• **Sensitivity:** Less than ½ microvolt for 10 dB S/N. • **I-f Selectivity:** 2.1 kHz at 6 dB, 3.6 kHz at 60 dB or 500 Hz at 6 dB for cw reception. • **Agc:** Full agc on received modes—audio output varies less than 3 dB for 60 dB change in signal level. Any amount of agc from zero to full can be obtained by adjustment of rf gain control. Time proven Drake agc system provides fast attack and slow release with noise pulse suppression, no pumping or popping evident. • **Antenna Input:** Nominal 50 ohms. • **Audio Response:** 400 to 2500 Hz at 6 dB. • **Audio Output Power:** 3 watts. • **Impedance:** 4 ohms.

CONTROLS

• **Front Panel Controls: "Main Tuning"** has spinner knob with adjustable skirt for calibrating main dial. Tunes VFO and rotates main dial. **"RF Tune"** tunes the rf circuits common to receiver rf amplifier and transmitter driver stages. 0-10 scale. **"Plate" and "Load"** tuning adjust pi-network capacitors in transmitter for proper resonance and loading on each band. Load control also converts ammeter to relative output when pushed in. **"Band"** switch selects desired ham band (see frequency coverage). **"Function"** switch has four positions "CAL, SSB, CW, AM." "CAL" operates built-in 100 kHz crystal calibrator for accurate setting of main tuning hair line indicator and knob skirt. "SSB" provides ssb operation, either VOX or PTT. "CW" provides for cw operation with automatic transmit receive switching and cw sidetone, and is used for tune up. "AM" provides for a-m operation with VOX or PTT, and with diode detector for receiving. **"Xmtr Gain"** functions as mike audio gain on ssb and a-m, and as carrier injection control on cw for tune and cw. **"Rcvr Gain"** knob controls receiver af gain and power ON-OFF switch. Lever behind knob controls setting of rf gain. **"Sideband"** switch in conjunction with indicator lights marked **"Upper"** and **"Lower"** selects desired sideband by connecting into the circuit either the upper or lower sideband filter, or cw filter • **Right Side Screwdriver Adjust Controls:** Vox Gain, Anti-Vox Gain, S-Meter Zero. • **Right Side Jacks:** Headphone (disconnects speaker circuit), Microphone (3-circuit for PTT), Key (normally closed). • **Rear Controls:** Sidetone gain, Dial light dimmer. • **Rear Jacks:** Power (connects TR-4Cw to power supply and speaker), MUTE (for muting an external receiver), EXT RCV (for connecting an external receiver to the antenna), Antenna (for connecting the TR-4 to the antenna). • **Left Side Controls**—Transceive/External receive switch (for selecting between the use of the TR-4Cw or an external receiver.) • **Inside Controls:** Carrier balance. • **Meters:** Receiver S-meter/transmitting agc indicator and plate ammeter/relative rf output indicator.

TR-4Cw ACCESSORIES

Model No. 1319 **Drake RV-4C Remote VFO** consists of a highly stable permeability-tuned solid-state VFO, a cathode follower, control circuitry and a 5-inch 4 ohm speaker. For use with TR-3 and TR-4 series transceivers, it permits reception, transmission, or both on a frequency different from the VFO setting of the transceiver, but in the same band to which the transceiver is tuned. • **Two Controls:** Main Tuning and RV-4C Function. • The RV-4C cabinet matches the transceiver and will house an AC-4 (or AC-3) power supply. • **Size:** 5.4″H x 10.8″W x 11.2″D (13.7 x 27.3 x 28.3 cm). **Weighs:** 6.5 lbs (3 kg).

Model No. 1315 **Drake FF-1 Fixed Frequency Adapter** allows crystal control operation on Receive or Transmit or both with up to two channels.

Model No. 1501 **Drake AC-4 Power Supply,** for use with all Drake 3 or 4 series transceivers and transmitters, supplies all the required voltages with the proper filtering and regulation and may be operated from 120 or 240 volts ac, 50 of 60 Hz. Fits inside the Model MS-4 Matching Speaker or the Remote VFO unit. • **SPECIFICATIONS: Input:** 120 or 240 volts ac 50/60 Hz. • **Output:** 650 volts dc at 300 mA average (500 mA peak). 250 volts dc at 175 mA. −45 to −65 volts dc adjustable bias into 33 K ohms. 12.6 volts ac at 5.5 amperes. • **Size:** 5″H x 10″W x 4.8″D (12.7 x 25.4 x 12 cm). • **Weight:** 17.2 lbs (7.8 kg).

Model No. 1505 **Drake DC-4 Power Supply** 12 V-dc Solid State for Drake 3 and 4-series transceivers.

Model No. 1511 **Drake MS-4 Matching Speaker** (details page 11).

DRAKE® Amateur VHF FM Transceiver

Drake TR-33C

- **SCPC* Frequency Control**
- **Lower Receiver Battery Drain**
- **Expanded Portable Antenna Choice**

**Single Crystal Per Channel*

• 12 Channels—only one crystal per channel provides simplex OR repeater operation on ANY channel. 2 channels supplied. 5 transmit offset positions, 3 supplied. • All FET front-end crystal filter for superb receiver intermod rejection. • Small convenient microphone included. • New lower power drain circuit on squelched receive. • Nicad rechargeable batteries supplied. • Built-in battery charger. • Ac and dc power cords supplied. • Telescoping screw-on antenna supplied, rubber helix optional. • Channel indicator light when using external dc supply. • Carry strap supplied. • Meter Indicates receive strength, xmit output, or battery voltage. • External speaker jack on rear panel. • Auxiliary jack on rear panel—may be used for tone-pad connections, etc. • Traditional R.L. Drake service backup.

ACCESSORIES

- **Model AA-10 Power Amplifier.**
- **Model AC-10 Power Supply.**
- **Accessory Crystals.**
- **Model MMK-33 Mobile Mount.**

DRAKE TR-33C SPECIFICATION'S

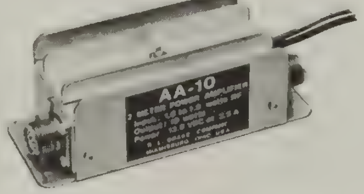
GENERAL: • **Frequency Coverage:** 146-148 MHz, 12 channels (2 supplied: 146.52 and 146.94). Crystal determines receive frequency. • Transmit frequency offset for repeater operation determined by 5-position switch: Simplex, +600 kHz, and −600 kHz supplied; any two additional offsets available with accessory crystals. • **Power requirements:** 13.0 volts dc ± 15% external supply OR internal battery supply. • **Current Drain (Batteries):** Squelched receive: 30 mA; transmit: 400 mA. External supply: above plus 45 mA for channel switch indicator lamp. • **Antenna:** 50 ohm external antenna through SO-239 connector OR screw-on telescoping whip antenna supplied, may be replaced with rubber helix antenna. • **Dimensions:** 5.5″ x 2.8″ x 8.5″ (13.8 x 5.8 x 21.6 cm). • **Weight:** 4.4 lbs (2 kg).

RECEIVER: • **Sensitivity:** less than .5 μV for 20 dB noise quieting. • **Selectivity:** ± 30 kHz adjacent channel rejection greater than 75 dB. • **Modulation acceptance:** at least ± 7 kHz. • **Inter modulation Rejection:** 70 dB referenced to sensitivity level. • **First i-f:** 10.7 MHz with monolithic crystal filter. • **Second i-f:** 455 kHz with ceramic filter. • **Audio Output:** nominal 1 watt at less than 10% distortion into 8 ohm built-in speaker or external speaker.

TRANSMITTER: • **Rf Output Power:** 1.5 watts nominal, with 13.0 volts dc supply. • **Frequency Deviation:** Direct frequency modulation adjustable to at least ± 7 kHz deviation, factory set at ± 5 kHz. • Separate microphone gain and deviation adjustments.

Drake AA-10 Power Amplifier

10 dB power increase greatly adds to the transmitting distance covered by and 2-meter fm transceiver running up to 1.8 watts output



Small size: 2″H x 2.1″W x 5.5″D (51 x 52 x 140 mm)

• Single stage solid-state balanced emitter vhf power transistor with VSWR protection. • Has no relays—automatic transmit/receive switching.

SPECIFICATIONS: • **Frequency Coverage:** 144-148 MHz. • **Rf Output Power:** 10 watts minimum at 13.8 volts dc and rated input power. • **Rf Input Power:** 1 watt nominal, 1.8 watt maximum. • **Receive Loss:** Fraction of 1 dB—unnoticeable. • **Connectors:** Type SO-239 Antenna and Transceiver Connectors. • **8 Semi-conductors.** • **Power Requirements:** 13.8 volts dc at 1.5 amperes.

Drake AC-10 Power Supply

Powers the AA-10, TR-22C, TR-33C and TR-72. Simultaneously can charge the TR-22C/33C nicads. Supplies 13.8 volts up to 3 amps from 120 V-ac 60 Hz input.

Drake Crystals

Fixed Frequency: Operation with:

T-4X* For operation below 10 MHz, Xtal.
T-4XB* Freq. = Oper. Freq. + 5.645.
T-4XC For operation above 10 MHz.
R-4A $\text{Xtal Freq.} = \frac{\text{Oper. Freq.} + 5.645}{2}$
R-4B

**Modified for fixed frequency operation*

Variable Frequency: Operation with:

T-4X
T-4XB
T-4XC
R-4A
R-4B
R-4C

Xtal Freq. = low end of Oper. Band. in MHz + 11.1.

Crystals for:

TR-33C

Specify Transmit or Receive and Frequency

SPR-4 Crystals

Operating Frequency in MHz	Crystal Frequency in MHz	Operating Frequency in MHz	Crystal Frequency in MHz
.15 — .5*		15.0 — 15.5*	26.09
.5 — 1.0*	11.59	15.5 — 16.0	26.59
1.0 — 1.5*	12.09	16.0 — 16.5	27.09
1.5 — 2.0	12.59	16.5 — 17.0	27.59
2.0 — 2.5	13.09	17.0 — 17.5	28.09
2.5 — 3.0	13.59	17.5 — 18.0*	28.59
3.0 — 3.5	14.09	18.0 — 18.5	29.09
3.5 — 4.0	14.59	18.5 — 19.0	29.59
4.0 — 4.5	15.09	19.0 — 19.5	30.09
4.5 — 5.0	15.59	19.5 — 20.0	30.59
5.0 — 5.5	16.09	20.0 — 20.5	31.09
5.5 — 6.0	16.59	20.5 — 21.0	31.59
6.0 — 6.5*	17.09	21.0 — 21.5	32.09
6.5 — 7.0	17.59	21.5 — 22.0*	32.59
7.0 — 7.5*	18.09	22.0 — 22.5	33.09
7.5 — 8.0	18.59	22.5 — 23.0	33.59
8.0 — 8.5	19.09	23.0 — 23.5	34.09
8.5 — 9.0	19.59	23.5 — 24.0	34.59
9.0 — 9.5	20.09	24.0 — 24.5	35.09
9.5 — 10.0*	20.59	24.5 — 25.0	35.59
10.0 — 10.5	21.09	25.0 — 25.5	36.09
10.5 — 11.0	21.59	25.5 — 26.0	36.59
11.0 — 11.5	22.09	26.0 — 26.5	37.09
11.5 — 12.0*	22.59	26.5 — 27.0	37.59
12.0 — 12.5	23.09	27.0 — 27.5	38.09
12.5 — 13.0	23.59	27.5 — 28.0	38.59
13.0 — 13.5	24.09	28.0 — 28.5	39.09
13.5 — 14.0	24.59	28.5 — 29.0	39.59
14.0 — 14.5	25.09	29.0 — 29.5	40.09
14.5 — 15.0	25.59	29.5 — 30.0	40.59

*SPR—4 normally supplied with these operating frequencies.

Crystal Frequencies for Equipment Working through Repeaters

Drake stocks TR-33C cystals for the following frequencies which are normally available for immediate shipment. Crystals for other frequencies usually require approximately four weeks delivery.

Repeater Frequencies	
Frequency in MHz	
Transmit†	Receive
146.01	146.61
146.04	146.64
146.07	146.67
146.10	146.70
146.13	146.73
146.16	146.76
146.19	146.79
146.22	146.82
146.25	146.85
146.28	146.88
146.31	146.91
146.34	146.94
146.37	146.97

Simplex Frequencies	
Frequency in MHz	
Transmit†	Receive
146.40	146.40
146.43	146.43
146.46	146.46
146.49	146.49
146.52	146.52
146.55	146.55
146.58	146.58

NOTE: Orders for crystals outside the 2 Meter Band will not be accepted.

†Standard Repeater and Simplex frequencies. Separate Transmit Crystals are not needed for the TR-33C since it uses a single Crystal per channel and has built-in standard Transmit offsets. Special offsets available.

SPR-4 CRYSTAL KITS

Amateur Bands—160m, 80m, 20m, 15m and 10m ranges. Six crystals cover:

1.5 — 2.0 MHz
3.5 — 4.0
14.0 — 14.5
21.0 — 21.5 MHz
28.0 — 28.5
28.5 — 29.0

Marine Bands—Eleven crystals cover:

2.0 — 2.5 MHz
2.5 — 3.0
4.0 — 4.5
8.0 — 8.5
8.5 — 9.0 MHz
12.0 — 12.5
13.0 — 13.5
16.5 — 17.0
17.0 — 17.5 MHz
22.0 — 22.5
22.5 — 23.0

Aeronautical Overseas—Seven crystals cover:

2.5 — 3.0 MHz
3.0 — 3.5
4.5 — 5.0
5.5 — 6.0
6.5 — 7.0 MHz
8.5 — 9.0
13.0 — 13.5

Time & Frequency Standard, WWV— Five crystals cover:

2.5 — 3.0 MHz
5.0 — 5.5
10.0 — 10.5
15.0 — 15.5 MHz (orginal equipment)
20.0 — 20.5
25.0 — 25.5

Citizens Band—One crystal and Frequency chart:

27.0 — 27.5 MHz* (*Generous overtravel gives additional 50 kHz or more off ends of each range).

Tropical Broadcast—Three crystals cover:

2.0 — 2.5 MHz
3.0 — 3.5 MHz
4.5 — 5.0 MHz

MARS—Five crystals cover:

2.0 — 2.5 MHz
3.0 — 3.5
4.0 — 4.5 MHz
5.0 — 5.5
18.0 — 18.5 MHz

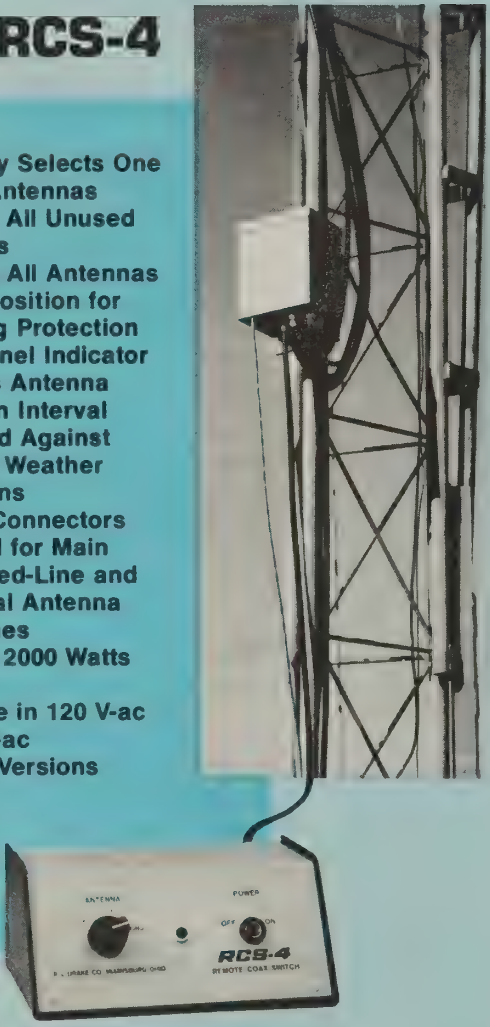
Teletype Commercial—UPI, AP, Stock Market, Weather, etc.—Four crystals cover:

7.5 — 8.0 MHz
9.0 — 9.5
13.5 — 14.0 MHz
15.5 — 16.0

Remote Coax Switch

Model No. 1518

Drake RCS-4



- **Remotely Selects One of Five Antennas**
- **Grounds All Unused Antennas**
- **Grounds All Antennas in Gnd Position for Lightning Protection**
- **Front Panel Indicator Monitors Antenna Selection Interval**
- **Protected Against Adverse Weather Conditions**
- **SO-239 Connectors Provided for Main Coax Feed-Line and Individual Antenna Feed-Lines**
- **Handles 2000 Watts PEP**
- **Available in 120 V-ac or 240 V-ac 50/60Hz Versions**

• Control unit works on 110/220 V-ac, 50/60 Hz, and supplies necessary voltage to motor. • Excellent for single coax feed to multiband quads or arrays of monobanders. The five positions allow a single coax feed to three beams and two dipoles, or other similar combinations. • Control cable (not supplied) same as for HAM-M rotator. • Selects antennas remotely, grounds all unused antennas. Gnd position grounds all antennas when leaving station. "Rain-Hat" construction shields motor and switches. • Up to 30 MHz, insertion of switch changes VSWR no more than 1.05:1. • From 30 MHz to 150 MHz, insertion changes VSWR no more than 1.5:1. • Motor: 24 V-ac, 2 amp. Lubrication good to −40°F. • Switch Rf Capability: Maximum legal limit.

Push Button Encoding Mike

Model No. 1525

Drake 1525EM

- Microphone and auto-patch encoder in single convenient package with coil cord and connector. Fully wired and ready for use.
- High accuracy IC tone generator, no frequency adjustments.
- High reliability Digitran® keyboard.
- Power for tone encoder obtained from transceiver through microphone cable. No battery required. Low current drain.
- Low output impedance allows use with almost all transceivers.
- Four pin microphone plug: directly connects to Drake TR-33C without any modification in transceiver. Compatible with all previous Drake and other 2 meter units with minor modifications.
- Tone level adjustable.
- Hang-up hook supplied.

SPECIFICATIONS:

• **Microphone Element Type:** Low impedance dynamic • **Frequency Response:** 300-5000 Hz • **Output Impedance:** 500 ohms • **Microphone Output Level:** −72 dBm per microbar. Approx 3mV (−47dBm) with average voice level • **Tone Encoder:** Single integrated circuit dual tone synthesizer • **Encoder Audio Level:** Adjustable from approx 1mV to 5mV with internal potentiometer • **Encoder Frequency Tolerance:** Better than ±1% from −20°C to +50°C • **Encoder Supply Voltage:** 7.5 to 15 Volts (Obtained through microphone cable from transceiver) • **Encoder Current Drain:** 5 to 20 mA depending on supply voltage • **Encoder Keyboard:** High reliability Digitran® keyboard • **Microphone Hanger:** Hook supplied • **Dimensions:** 2.6" x 3.5" x 1.7" (6.6 x 8.9 x 4.3 cm) • **Weight:** 8 oz. (.227 kg)

Drake 1525EM, microphone with tone encoder and connector for TR-33C, TR-72, TR-22C, ML-2

Drake 7073DM as above but without tone encoder

R. L. DRAKE COMPANY DRAKE®

540 Richard St., Miamisburg, Ohio 45342
Phone: (513) 866-2421 • Telex: 288-017

Western Sales and Service Center, 2020 Western Street, Las Vegas, Nevada 89102 • 702/382-9470

LITHO IN U.S.A.

JANUARY 1977

DRAKE®

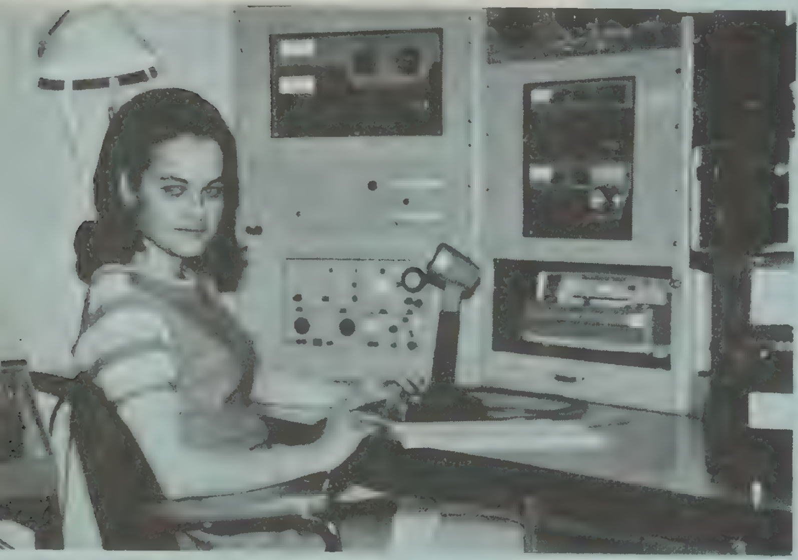
Equipment for Radio Communications

FULL LINE CATALOG

DRAKE®

Known throughout the world for quality...

Radio Communications Equipment



Seeking a better way, in 1943 a young electrical engineer, with a significant background in radio design for major industrial concerns, launched the R.L. DRAKE COMPANY.

From a modest beginning, Robert L. Drake guided the growth of his company to a position of international importance in the communications field. Today, all over the world, wherever radio communications equipment is used, the name DRAKE is held in high esteem.

The extraordinary acceptance of DRAKE products rests on a solid foundation of customer satisfaction . . . in the outstanding performance of Drake Radio products.

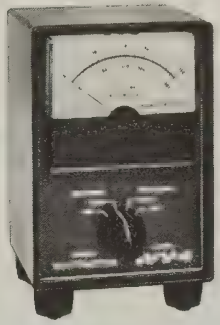
R. L. DRAKE COMPANY
540 Richard Street, Miamisburg, Ohio 45342
Phone (513) 866-2421 • Telex 288-017

Drake Directional RF Wattmeters

Model No. 1513

Drake W-4

1.8-54 MHz



Model No. 1515

Drake WV-4

20-200 MHz

Drake directional, through line wattmeters, using printed circuits, toroids, and state of the art techniques, permit versatile performance and unsurpassed accuracy, yet at a lower cost.

In contrast to VSWR measuring devices of the past, Drake wattmeters are frequency insensitive throughout their specified range, requiring no adjustments for power or VSWR measurements.

Negligible insertion loss allows continuous monitoring of either forward or reflected power for fast accurate tune up and checking of transmitter-antenna performance.

Indirectly measure radiated power (forward power minus reflected power) and VSWR by means of a plastic nomogram included.

Each wattmeter makes possible quick, accurate adjustments of antenna resonance and impedance match, when placed between transmitter and matching network.

High accuracy; ideal as laboratory instruments.

Removable coupler allows remote metering.

Specifications	W-4	WV-4
Frequency Coverage	1.8-54 MHz	20-200 MHz
Line Impedance	50 ohm resistive	50 ohm resistive
Power Capability	2000 W continuous	1000 W continuous
Jacks, Removable Coupler	Two S0239 input and output connectors	Type N input and output connectors.
Semiconductors	Two 1N295 power meter rectifiers	Two 1N695 power meter rectifiers
Accuracy	± (5% of reading +1% of full scale)	
VSWR Insertion	Insertion of wattmeter in line changes VSWR no more than 1.05:1	
Size—Cabinet:	6″H x 3.7″W x 4″D (15.3 x 9.4 x 10.2 cm)	
Coupler:	2.3″H x 3.5″W x 2.5″D (5.7 x 8.9 x 6.4 cm)	
Shipping—Weight:	3 lbs. (1.4 kg)	
Size:	8 x 5.8 x 7″ (20.3 x 14.6 x 17.8 cm)	
CONTROLS	Front panel 4 position switch selects scale and reflected power.	

Drake TVI Filters

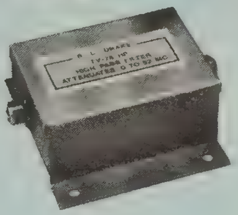
High Pass Filters for TV Sets

provide more than 40 dB attenuation at 52 MHz and lower. Protect the TV set from amateur transmitters 6-160 meters.

Model No. 1603

Drake TV-300-HP

For 300 ohm twin lead



Model No. 1610

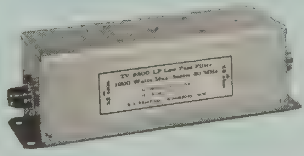
Drake TV-75-HP

For 75 ohm TV coaxial cable; TV type connectors installed

Low Pass Filters for Transmitters

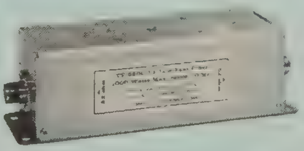
have four pi sections for sharp cut off below channel 2, and to attenuate transmitter harmonics falling in any TV channel and fm band. 52 ohm. SO-239 connectors built in.

Model No. 1608 **Drake TV-3300-LP**



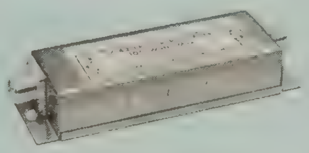
1000 watts max. below 30 MHz. Attenuation better than 80 dB above 41 MHz. Helps TV i-f interference, as well as TV front-end problems.

Model No. 1609 **Drake TV-5200-LP**



200 watts to 52 MHz. Ideal for six meters. For operation below six meters, use TV-3300-LP or TV-42-LP.

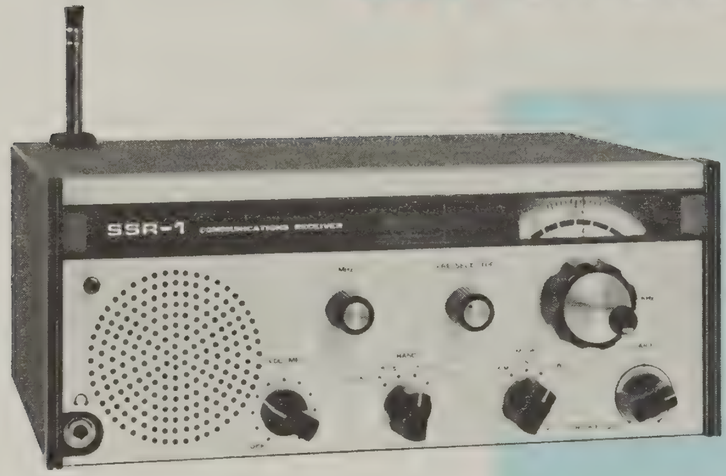
Model No. 1605 **Drake TV-42-LP**



is a four section filter designed with 43.2 MHz cut-off and extremely high attenuation in all TV channels for transmitters operating at 30 MHz and lower. Rated 100 watts input.

Model No. 8201

Drake SSR-1



- **Synthesized**
- **General Coverage**
- **Low Cost**
- **Selectable Sidebands**
- **All Solid State**
- **Built-in Ac Power Supply**
- **Excellent Performance**

The SSR-1 Receiver provides precision tuning over the short wave spectrum of 0.5 to 30 MHz with capability of reception of a-m (amplitude modulated), cw (continuous wave) and ssb (upper and lower single side band) signals.

A synthesized/drift-cancelling 1st mixer injection system giving thirty tunable ranges from 0.5 to 30 MHz is derived from a single 10 MHz crystal oscillator providing frequency stability necessary for ssb operation.

A stable low frequency VFO tunes each of the 30 one-MHz ranges with a dial accuracy of better than 5 kHz which is sufficient to locate and identify a station whose frequency is known.

Separate detectors (product and diode) are used to provide for best performance whether listening to ssb or a-m signals. Narrow band selectivity for ssb and wide band selectivity for a-m reception is provided.

A manual tuned preselector provides for maximum sensitivity and maximum interference rejection.

Solid state circuitry throughout allows efficient operation from built-in ac power supply, internal batteries or external 12 V-dc source.

FRONT PANEL CONTROLS

MHz: Sets the MHz range of the received frequency. This control tunes the smaller inner dial (1) and is adjusted for the center of the desired MHz range.

Signal Meter: Indicates relative rf input signal level.

Pre-selector: Adjusts receiver rf tuned circuits for proper reception of signal. This control is tuned for maximum signal or noise at the selected frequency.

Frequency Display: Indicates tuned frequency.

The inner dial indicates MHz range and the outer dial indicates kHz reading. As an example: 5.750 MHz.

kHz: Tunes the kHz range of the receiver. This control turns the large outer dial (2) and is adjusted for the proper frequency as displayed on the graduations. This dial has a graduated scale from 000 to 1000 and is read as 0 to 1000 kHz or .000 to 1.000 MHz.

Clarify: Provides ultra fine frequency adjustment (approximately ±3 kHz range). This control is used primarily on ssb and cw signals for setting the pitch or sound accurately after the station has been roughly tuned in. It should be in the center position before any tuning is commenced.

Mode: Selects mode of reception. A-m (amplitude modulation), usb (upper single side band) and lsb (lower single side band). Cw (continuous wave) may be received on either usb or lsb position. The mode selector selects the proper detector (product detector for ssb and diode detector for a-m and i-f selectivity filter.

Band: Selects the proper range of received frequency.

Off-Volume: Turns radio on and off and adjusts audio output level.

Phone Jack: For ear phone reception or external speaker (8 ohms). Insertion of jack disconnects internal speaker.

Pilot Lamp Switch: On ac operation the pilot lamps are always lighted. The pilot lamps are normally extinguished on battery operation to conserve battery life. Pushing this momentary action switch turns on the pilot lamps.

Built-in Telescoping Antenna: The SSR-1 has such sensitivity that it operates near maximum practical limits. For optimum results, the receiver should be connected to an external antenna.

BACK PANEL CONTROLS

Record, External Battery, Mute Jack, Antenna Terminal Strip, Antenna Attenuator, Fuse.

DRAKE SSR-1 SPECIFICATIONS

I-f Rejection:
Greater than 50 dB @ f_d below 20 MHz.
Greater than 40 dB @ f_d above 20 MHz.

Antenna: Self contained telescopic whip antenna. External connection to terminal strip. (75 ohm input impedance—unbalanced.)

Frequency Coverage: 0.5 to 30 MHz in 30 ranges each tunable over 1 MHz range with a dial having 10 kHz graduations.

Reception Modes: Cw, usb, lsb, a-m.

Sensitivity: At least 10 dB S+N/N under the following conditions:

Mode	Freq.	Input Level*
Ssb	0.5-2 MHz	1.0μV
	2-30 MHz	0.3μV
A-m	0.5-2 MHz	3.0μV
	2-30 MHz	1.0μV

(A-m: 1000 Hz @ 30% modulation.)

Output: Capable of 200 mW output on ssb at 2 MHz with input signal of 0.5μV and 2 watts output with 5μV input.

Audio Distortion: Less than 5% @ 2 watts.

Calibration Accuracy: Within 5 kHz at all frequencies.

Selectivity Mode	Bandwidth 6 dB
Ssb	3 kHz ±25%
A-m	5.5 kHz ±25%

Image Rejection: Greater than 50 dB

Audio Output Provisions: Internal 8 ohm speaker and phone jack on front panel that disables speaker when plugged in.

Muting Provisions: External mute jack (RCA type) that provides normal reception with closed circuit and mute with open circuit connections.

Power Supply: 8 type "D" (1.5 V) dry cell batteries (not included). Tapped transformer to provide operation from 117 V ±15% or 240 V ±10%-20%, 50-60 Hz source with automatic switch over to batteries when ac line is disconnected.

Current Consumption: Less than 100 mA quiescent at 12 V-dc.

Dial Lights: Momentary push button to light when on battery operation. Always on for ac operation.

Clarifier: Tunes minimum of ±2 kHz and maximum of ±5 kHz.

Size: 5.5″H x 13″W x 11″D (14 x 33 x 28 cm).

Weight: 14 lbs. (6.4 kg)

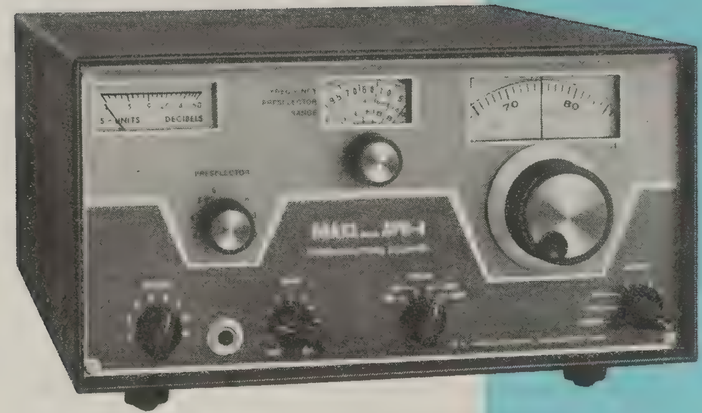
These voltages are ½ the open circuit signal generator voltage, i.e., the voltage read on the meter of a HP Model 606 Generator.

ACCESSORIES AVAILABLE:

Model No. 7078 **Drake HS-1 Headphones,**
Model No. 8202 **Drake DC-PC Dc Power Cord,**
Model No. 1237 **Drake AN-5 Antenna Kit,**
Model No. 7040 **World Radio & TV Handbook.**

[illegible]
1221

Drake SPR-4



- Programmable to meet specific requirements: SWL, Amateur, Laboratory, Broadcast, Marine Radio, etc.
- Direct frequency dialing: 150-500 kHz plus any 23 500 kHz ranges, 0.5 to 30 MHz
- FET circuitry, all solid state
- Linear dial, 1 kHz readout
- Band-widths for cw, ssb, a-m with built-in LC filter
- Crystals supplied for LW, seven SW, and bc bands
- Notch filter
- Built-in speaker

The Drake model SPR-4 communications receiver may be programmed to suit your present and future needs. It is ideal for short wave listening or monitoring, aircraft radio and weather, marine ship and shore stations, hf communications, WWV time signals, CB, standard broadcast monitoring or DXing, amateur radio, civil defense, government, or use as a laboratory instrument.

In designing the SPR-4, Drake engineers incorporated the dual gate FET to produce the first no-compromise solid state receiver. Unlike receivers with bipolar transistors which have poor cross-modulation, intermodulation, agc, and overload performance; the SPR-4 has signal handling capabilities superior to the best tube receivers. In addition, the SPR-4 has all of the advantages of a solid-state design such as low power consumption, mechanical and thermal stability, reliability, etc.

The SPR-4 comes with ten bands installed which cover long wave, standard broadcast, and seven shortwave broadcast bands. Other bands, each with 500 kHz tuning range, can be added by purchasing a crystal which comes with an adhesive transparent dial sector for that range. A total of 24 bands are possible from 150 kHz to 30 MHz.

The main tuning dial reads 0 to 500 kHz with 1 kHz graduation marks using two concentric transparent discs, 0 to 100 kHz is indicated on one disc and hundreds of kHz are indicated on the other disc.

DRAKE SPR-4 SPECIFICATIONS

Frequency Coverage: Can be programmed with accessory crystals for 23 ranges (each tuning a 500 kHz band) from 0.5 to 30 MHz plus 150 to 500 kHz. Crystals supplied with the receiver allow coverage on these ranges: 150-500 kHz, 0.5-1.0 MHz, 1.0-1.6 MHz*, 6.0-6.5 MHz, 7.0-7.5 MHz, 9.5-10 MHz, 11.5-12 MHz, 15-15.5 MHz, 17.5-18 MHz, 21.5-22 MHz.

Modes of Operation: A-m. cw, lsb, usb, (RTTY with RY-4 accessory installed).

Selectivity: A-m: 4.8 kHz @ -6 dB, 10 kHz @ -60 dB. Ssb: 2.4 kHz @ -6 dB, 7.2 kHz @ -60 dB. Cw: 0.4 kHz @ -6 dB, 2.7 kHz @ -60 dB.

Intermediate Frequencies: 1st i-f 5645 kHz four pole crystal lattice filter, 2nd i-f 50 kHz four pole Hi-Q Ferrite LC filter.

Frequency Stability: At room temperature, drift for all causes (including ± 10% change in supply voltage) is less than ± 100 Hz.

Sensitivity: Ssb and cw: 0.25 microvolt for 10 dB S+N/N, a-m: 0.5 microvolt with 30% modulation for 10 dB S+N/N.

Image Rejection: Greater than 60 dB below 15 MHz. Greater than 50 dB above 15 MHz.

Blocking: An undesired unmodulated signal at least 20 kHz above or below a desired signal of .25 microvolt must be 90 dB stronger than the .25 microvolt signal to cause a 3 dB reduction of the signal to noise ratio of the desired signal.

Cross Modulation: An unwanted signal (modulated 30% at 1 kHz) removed by at least 20 kHz from a desired signal of 1 microvolt, must have a signal level of at least 10 millivolts to produce a noticeable crossmodulation of the desired signal.

Intermodulation: Using a reference signal of .25 microvolt, two interfering signals of equal strength within the passband of the receiver front-end selectivity must each have a strength of at least 65 dB above the reference signal to produce third order products equal to the .25 microvolt reference signal.

Automatic Gain Control: Agc is used on a-m, cw, and ssb. Time constants are selected for the optimum effectiveness on each mode. Audio output is held constant to 6 dB over a 100 dB range of input signals. Jumper wire allows choice of fast or slow release on cw.

Input Impedance: 50 ohms approximately (high impedance 150 kHz to 1500 kHz)

Excessive Rf Input Voltage Protection: Withstands 30 volts rms from a 50 ohm generator continuously.

Output Power: 3 watts into 4 ohm load (less into higher impedance loads).

Power Consumption: 18 watts on 120 V-ac or 5¾ watts on 12 V-dc, 2.5 watts on 12 V-dc with dial lights turned off and with audio output adjusted for normal listening level.

Calibration: Dial is accurate to better than ± 1 kHz when calibrated at nearest 100 kHz calibration point.

Hum and Noise: More than 60 dB below rated output.

Size and Weight: 5.5″H x 10.8″W x 12.3″D (14 x 27.4 x 31.2 cm), 18 lbs (8.2 kg).

**Generous overtravel gives additional 50 kHz or more off each end of range.*

ACCESSORIES

Matching Speaker: Same size as SPR-4, has 5 x 7 speaker. Model No. 1511 Drake MS-4.

Calibrator: Plug-in 100 kHz crystal oscillator with harmonics that occur at 100 kHz intervals throughout the range of SPR-4. Model No. 1223 Drake SCC-4.

Noise Blanker: Plug-in i-f type noise blanker mutes receiver for duration of each noise pulse. 16 transistors, 2 diodes. Model No. 1227 Drake 5-NB.

Loop Antenna: Directional antenna nulls out undesired stations, plugs into receptacle through top of the cabinet, operates from 150 kHz to 1600 kHz only. Model No. 1235 Drake AL-4.

Antenna Kit: Consists of wire, insulators, lead-in, and instructions. Model No. 1237 Drake AN-5.

Dc Power Cord: Plugs into cigar lighter in an automobile, allows SPR-4 to be used on 12 volts dc supply. Model No. 1229 Drake DC-PC.

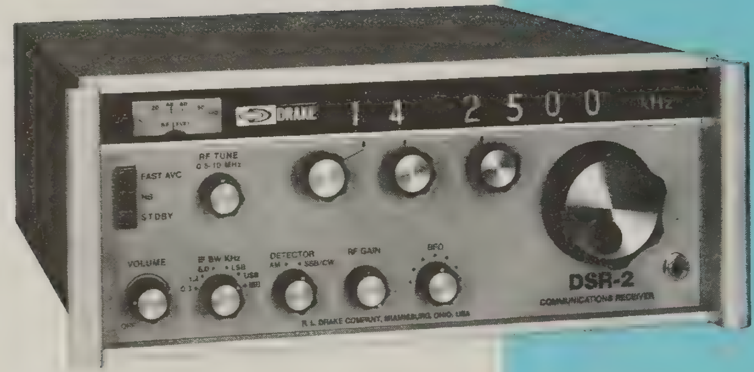
Teletype Adapter: Allows reception of standard teletype tones 2125/2975 Hz and 2125/2295 Hz by remote shifting BFO. Model No. 1225 Drake RY-4.

Transceive Adaptor: Allows SPR-4 to transceive with all T-4 and T-4X Transmitters. Consists of printed circuit board and connectors. Model No. 1224 Drake TA-4.

Headphone: Model No. 7078 Drake HS-1.

[illegible]
1242

Drake DSR-2



- Continuous Coverage 10 kHz to 30 MHz
- Digital Synthesizer Frequency Control
- Frequency Displayed to 100 Hz
- All Solid State
- A-m, Ssb, Cw, RTTY, Isb
- Series Balanced Gate Noise Blanker
- Front End Protection
- Optional Features Available on Special Order

The R. L. Drake Model DSR-2 Receiver is a high grade communications receiver employing the most up-to-date solid state devices and circuitry. It provides continuous coverage from 10 kHz to 30 MHz. The received frequency is displayed on six nixie tubes to the nearest 100 Hz.

Frequency injections of the DSR-2 are controlled by a phase-locked digital synthesizer which allows incremental frequency selection in 10, 1, and 0.1 MHz steps. The remaining 0 to 0.1 MHz is continuously adjustable by a highly stable variable oscillator controlled from the fine tuning knob on the front panel. Modular construction on easily accessible printed circuit boards is used throughout the DSR-2. Extensive use of dual gate MOSFET transistors in the DSR-2 circuitry contributes to its superior intermodulation, avc, wide dynamic range and overload performance.

The front panel controls allow the operator to select frequency (with fine tune control), a-m or ssb product detector, i-f bandwidth, af gain, BFO pitch, fast or slow avc, manual rf gain, standby position, and the highly effective Drake series gate noise blanker. Isb (Independent Sideband) is a built-in feature of the DSR-2. Separate i-f crystal filter, i-f amplifier, and audio output circuits allow two simultaneous communication channels to be employed on one frequency assignment, doubling the information receiving capacity.

Front-end protection includes special circuitry built-in to provide protection against transmitters

in close proximity. It will withstand a 30 volt emf from a 50 ohm source, with the receiver on or off.

The normal avc system has appropriate attack and decay times to provide proper clean reception of ssb and cw signals. This avc system operates on both the rf and i-f circuitry to provide reception free of 'popping.' The rf avc provides an additional control under very strong signal conditions to increase the dynamic range. Front panel controls are available to decrease the decay time of the avc circuitry, to disconnect the avc circuitry and to provide manual control.

DRAKE DSR-2 SPECIFICATIONS

Frequency Range: 10 kHz to 30 MHz continuous range.

Modes of Operation: Usb, lsb, cw, RTTY, a-m, isb.

Frequency Readout: Complete to 100 Hz on six Nixie tubes.

Frequency Selection: 10 MHz, 1 MHz, 0.1 MHz steps switch selected. 0 to 0.1 MHz continuously variable.

Frequency Stability: Frequency drift does not exceed 200 Hz in any 8 hour period at constant ambient temperature between 0° and 40°C and ± 10% variation from nominal line voltage after ½ hour warmup.

Sensitivity: 0.01—0.5 MHz: Less than 4 microvolts for 10 dB SINAD at 2.4 kHz ssb mode. Less than 25 microvolts for 10 dB SINAD at 6 kHz a-m mode with 30% modulation. 0.5—30 MHz: Less than 0.3 microvolts for 10 dB SINAD at 2.4 kHz ssb mode. Less than 2 microvolts for 10 dB SINAD at 6 kHz a-m mode with 30% modulation.

Image Rejection: Greater than 60 dB relative to 1 microvolt below 10 MHz. Greater than 50 dB relative to 1 microvolt above 10 MHz.

I-f rejection: Greater than 60 dB relative to 1 microvolt except in range of 4.5 to 5.5 MHz.

Rf Blocking: Greater than 100 dB relative to 1 microvolt.
*Desired signal at 60 dB above 1 microvolt with a blocking signal removed 20 kHz and its amplitude adjusted to reduce desired signal 3 dB.

Crossmodulation: 70 dB relative to 1 microvolt.
*Desired signal at 60 dB above 1 microvolt with undesired signal removed 20 kHz and its amplitude adjusted for crossmodulation products 30 dB lower than desired signal.

Intermodulation: 70 dB relative to 1 microvolt.
*Level of two undesired signals, removed at least 30 kHz from the desired frequency, required to produce the equivalent audio output as desired signal 30 dB greater than 1 microvolt.

Opposite Sideband Suppression: Greater than 60 dB at 500 Hz into the opposite sideband.

I-f Bandwidth (in kHz):

Selectivity	**−6 dB**	**−60 dB**
6	6	11.5
2.4	2.4	4.3
1.2	1.2	2.4
0.3	0.3	0.6

Optional filters available for other bandwidths.

Automatic Volume Control: Audio output increases less than 3 dB for an rf input change of 100 dB.

Attack Time	1 millisecond
Release Time: (normal avc)	1 second
(fast avc)	100 milliseconds

Antenna Input Impedance:

10 kHz to 500 kHz	1000 ohms
500 kHz to 30 MHz	50 ohms

Antenna Input Protection: The receiver has built-in protection to prevent damage from a 30 volt signal applied to the antenna for a 15 minute period.

Audio Output: Communications channel: 2 watts at 5% maximum distortion into 4 ohm load (4 ohms unbalanced). 1 milliwatt into 600 ohm load (600 ohms balanced and center tapped). Isb channel: 1 milliwatt into 600 ohm load (600 ohms balanced and center tapped).

Audio Hum and Noise: Greater than 60 dB below rated output.

BFO: Derived from 5 MHz standard oscillator, or variable over a ± 3 kHz range from front panel control.

Power Requirements: 120/240 volts ± 10% single phase 50 to 420 Hz, 35 watts.

Dimensions: 5.5"H x 13.4"W x 15"D (14 x 34 x 38 cm).

Weight: 17 lbs (7.7 kg).

**Measurement Procedure*

1211

Drake R-4C

Solid State Linear permeability-tuned VFO with 1 kHz dial divisions. Gear driven dual circular dials. High mechanical, electrical and temperature stability.

Covers ham bands with crystals furnished. Covers all of 80, 40, 20 and 15 meters, and 28.5-29.0 MHz of 10 meters.

Covers 160 meters with accessory crystal. In addition to the ham bands, tunes any fifteen 500 kHz ranges between 1.5 and 30 MHz, 5.0 to 6.0 MHz not recommended. Can be used for MARS, WWV, CB, Marine and Shortwave broadcasts.

Superior selectivity: 2.4 kHz 8-pole filter provided in ssb positions. 8.0 kHz, 6 pole selectivity for a-m. Optional 8-pole filters of .25, .5, 1.5 and 6.0 kHz bandwidths available.

Tunable notch filter attenuates carriers within passband.

Smooth and precise passband tuning.

Transceive capability; may be used to transceive with the T-4X, T-4XB or T-4XC Transmitters. Illuminated dial shows which PTO is in use.

Usb, lsb, a-m and cw on all bands.

Agc with fast attack and two release times for ssb and a-m or fast release for break-in cw. Agc also may be switched off.

New high efficiency accessory noise blanker that operates in all modes.

Crystal lattice filter in first i-f prevents cross-modulation and desensitization due to strong adjacent channel signals.

Excellent overload and intermodulation characteristics.

25 kHz Calibrator permits working closer to band edges and segments.

Scratch resistant epoxy paint finish.

DRAKE R-4C SPECIFICATIONS

Frequency Coverage: 3.5-4.0 MHz, 7.0-7.5 MHz, 14.0-14.5 MHz, 21.0-21.5 MHz and 28.5-29.0 MHz with crystals supplied. Fifteen accessory crystal sockets are provided for coverage of any 15 additional 500 kHz ranges between 1.5 and 30.0 MHz with the exception of 5.0-6.0 MHz.

Selectivity: Ssb—2.4 kHz at 6 dB down, 4.2 kHz at 60 dB down. A-m—8.0 kHz at 6 dB down, 28.0 kHz at 60 dB down. Filters with 0.25, 0.5, 1.5 and 6.0 kHz bandwidths at the −6 dB points are available for the cw1, cw2 and a-m modes. Product detection is used in the ssb, cw1 and cw2 modes; diode detection is used in the a-m mode. Agc switching is independent of mode switching.

I-f Frequencies: First i-f 5645 MHz wth 4-pole crystal filter. **Second** i-f 5695 MHz with 8-pole cyrstal lattice filter, and **third** i-f is 50 kHz with 2 LC tuned circuits.

Stability: Less than 100 Hz after warm-up. Less than 100 Hz for 10% change in line voltage.

Sensitivity: Less than 0.25 μV for 10 dB signal plus-noise-to-noise on all amateur bands. Less than 0.5 μV at any frequency.

Modes of Operation: Ssb, cw, a-m, RTTY, SSTV.

Dial Calibration: Main dial is calibrated from 0 to 500 kHz in 1 kHz increments. Calibration Accuracy: Better than 1 kHz when calibrated to the nearest 100 kHz point. Markers are at 25 kHz for greater accuracy.

Automatic Gain Control: Amplified agc has fast attack (less than 1 ms) and 3 selectable release times. Slow release is 1.0 second, medium release is 350 ms, and fast release is 50 ms. Audio output increases not more than 3 dB for 100 dB rf input change. (1 μV to 0.1 volt).

Audio Ouput: At least 2.0 watts into a 3.2 ohm load. 3000 ohm output available for anti-VOX.

Antenna Input Impedance: 52 ohms nominal.

Spurious Repsonses: Image rejection more than 70 dB; i-f rejection more than 70 dB on amateur ranges. Internal spurious ranges in amateur bands less than the equivalent of the 1 μV signal at the antenna.

Power Consumption: 60 watts, 120/240 V-ac, 50 to 400 Hz.

Dimensions: 5.5″H x 10.8″W x 11.7″ cabinet depth, 12.8″ overall depth (14 x 27.3 x 32.4 cm).

Weight: 17 lbs (7.7 kg).

CONTROLS AND JACKS

Front Panel: Main tuning, agc switch, passband tuning, notch filter, mode switch, function switch, preselector tuning, af and rf gain controls, bandswitch, accessory crystal switch and headphone jack.

Rear Panel: S-meter zero control, crystal filter sockets, auxiliary crystal sockets, accessory power socket, 120/240 V-ac power switch, line fuse, carrier oscillator jack, antenna jack, speaker jack, mute jack, anti-VOX/sidetone jack, PTO lamp jack and transmitter carrier oscillator jack.

C-Line Accessories

Model No. 1511

Drake MS-4 Matching Speaker

(Shown on facing page) for use with R-4, R-4A, R-4B and R-4C Receivers. (Has space to house AC-3 and AC-4 Power Supplies).

Power Supplies for T-4, T-4X, T-4XB or T-4XC (The AC-4 can be housed in an MS-4 speaker cabinet).
Model No. 1501 Drake AC-4
Model No. 1505 Drake DC-4

Accessory Bandwidth Filters available: Model No. 7011 Drake FL250, Model No. 7013 Drake FL500, Model No. 7015 Drake FL1500, Model No. 7017 Drake FL4000, Model No. 7019 Drake FL6000.

Linear Amplifier see page 15

RF Wattmeters see page 3

Matching Networks and FS-4 Synthesizer see page 14

Push Button Encoding Mike see page 20

DRAKE MICROPHONES

Wired for use with Drake transmitters and transceivers, for either push-to-talk or VOX. Type of operation is determined by the VOX control setting of the transmitter.

Desk Type Model No. 7075

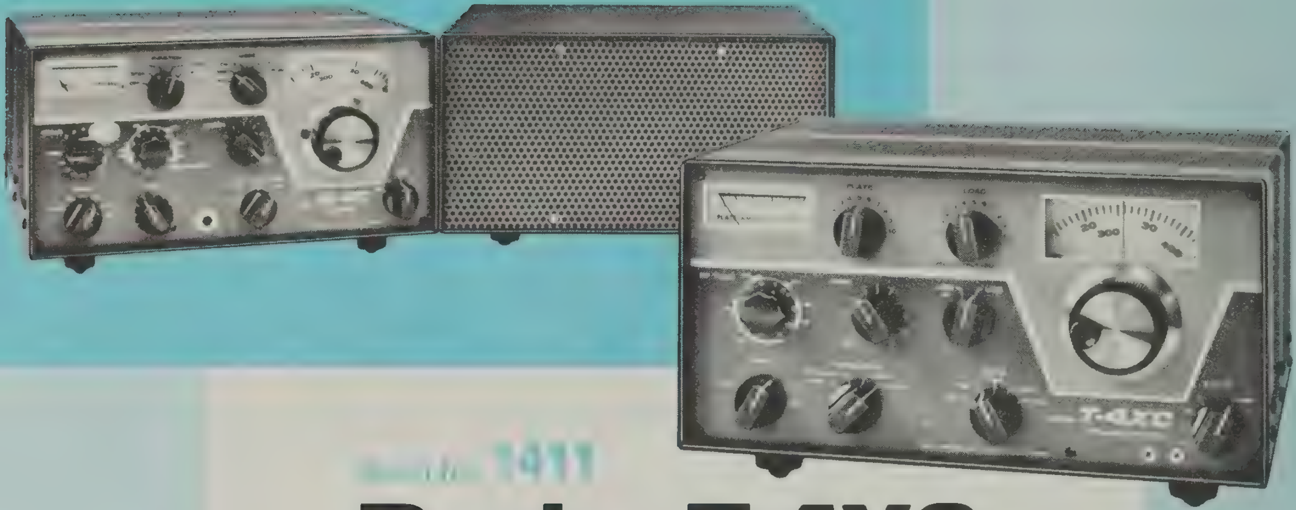
• **Type:** Heavy Duty Ceramic Desk Top • **Cable:** Four Foot, 3-Conductor, One Shield • **Output Level:** Minus 54 dB (0 dB = 1 volt/microbar) • **Frequency Reponse:** 80-7000 Hz • **Switching:** Adapts to either push-to-talk or VOX.

Hand-Held Type Model No. 7072

• **Type:** Ceramic, hand held • **Cable:** 11″ Retracted, 5′ extended, PVC 3 Cord, 1 shielded, Coil Cord • **Case:** Cycolac • **Finish:** Grey • **Output Level:** Minus 65 dB (0 dB = 1 volt/microbar) • **Frequency Response:** 300-3000 Hz • **Switching:** Adapts to either push-to-talk or VOX.

DRAKE®

C-Line Amateur Transmitter



[illegible] 1411

Drake T-4XC

Solid State Linear permeability-tuned VFO with 1 kHz dial divisions. Gear driven dual circular dials. High mechanical, electrical and temperature stability.

Covers ham bands with crystals furnished. Covers all of 80, 40, 20 and 15 meters, and 28.5-29.0 MHz of 10 meters.

Covers 160 meters with accessory crystal. Four 500 kHz ranges in addition to the ham bands plus one fixed-frequency range can be switch-selected from the front panel.

Two 8-pole crystal lattice filters for sideband selection.

Transceives with the R-4, R-4A, R-4B, R-4C and SPR-4 Receivers. Switch on the T-4XC selects frequency control by receiver or transmitter PTO or independently. Illuminated dial shows which PTO is in use.

Usb, lsb, a-m and cw on all bands.

Controlled-carrier modulation for a-m is compatible with ssb linear amplifiers.

Automatic transmit-receive switching. Separate VOX time-delay adjustments for phone and cw. VOX gain is independent of microphone gain.

Choice of VOX or PTT. VOX can be disabled by front panel switch.

Adjustable pi network output.

Transmitting agc prevents flat-topping.

Meter reads relative output or plate current with switch on load control.

Built-in cw sidetone.

Spotting function for easy zero-beating.

Easily adaptable to RTTY, either fsk or afsk.

Compact size; rugged construction. Scratch resistant epoxy paint finish.

DRAKE T-4XC SPECIFICATIONS

• **Frequency Coverage:** 3.5-4.0 MHz, 7.0-7.5 MHz, 14.0-14.5 MHz, 21.0-21.5 MHz and 28.0-28.5 MHz with crystals supplied. Four accessory crystal sockets are provided for additional 500 kHz ranges between 1.8 and 30.0 MHz, excluding 2.3-3.0 MHz, 5.0-6.0 MHz and 11.0-12.0 MHz. Crystals for fixed-frequency operation may be plugged into a front-panel socket for use between 1.8 and 30.0 MHz, excluding 2.3-3.0 MHz, 5.0-6.0 MHz and 10.5-12.0 MHz. • **Dial Calibration:** Main dial is calibrated from 0 to 500 kHz in 1 kHz increments. Calibration Accuracy: Better than 1 kHz when calibrated to the nearest 100 kHz point. • **Stability:** Less than 100 Hz after warm up. Less than 100 Hz with 10% change in line voltage. • **Modes of Operation: Ssb:** Upper or lower sideband on all bands. VOX or Push-to-talk. • **Cw:** Grid-block keying. VOX circuit is keyed for automatic transmit-receive switching. Sidetone oscillator is keyed for monitoring. Shifted carrier system has no spurious outputs. • **A-m:** Controlled-carrier a-m modulation system is built in. This system is compatible with ssb linear amplifiers. VOX or push-to-talk. • **RTTY:** Two methods of RTTY are available. **1.** The VFO is easily adaptable to fsk. Signal frequency shifts the same direction on all bands and the same amount on any band with a given dial setting. **2.** The RTTY signal also may be generated by applying undistorted audio tones at the mike input in the ssb mode. A jack is provided at the rear panel to shift the carrier oscillator frequency by an amount that, in the lsb position, the frequency bandpass through the sideband filter is shifted so that the tones of 2125 and 2975 Hz will pass with equal amplitude. • **Sideband Suppression:** 60 dB or better. Carrier Suppression: 60 dB or better. • **Average Distortion Products:** at least 30 dB down. • **Frequency Response:** 350 to 2750 Hz at 6 dB down. • **Input Power:** Ssb and a-m—200 watts PEP, cw—200 watts. • **Output Impedance:** Nominal 52 ohms adjustable with pi network. (SWR should be 2:1 or less). • **Microphone Input:** High impedance. • **Agc:** Operates on ssb to prevent flat-topping due to overdrive. • **Power Requirements:** (Provided by AC-3 and AC-4 power supplies). 650 volts dc at 200 mA average and 330 mA maximum with better than 10% regulation from 50 mA to 330 mA and maximum ripple of less than 1%. 250 volts dc at 120 mA with 10% regulation from 82 mA to 120 mA. This includes the effect of the 650 volt supply change if both voltages are obtained from the same transformer. Maximum ripple must be less than ¼%. Also −45 to −65 volts dc adjustable filtered bias into a 33 k ohm load, and 12.6 volts ac or dc at 3 amps. • **Dimensions:** 5.5″H x 10.8″W x 11.7″ cabinet depth, 12.8″ overall depth (14 x 27.3 x 31.4 cm). • **Weight:** 14.6 lbs (6.6 kg).

CONTROLS AND JACKS:

• **Front:** Main tuning, accessory crystal switch, mode switch, sideband selector, band switch, transceive switch, rf tune, microphone gain, plate tuning, plate loading control with relative output swtich, and fixed-frequency crystal socket. • **Rear:** Power connector, mute jack, receiver antenna jack, antenna connector, anti-VOX/sidetone jack, receiver injection jack, RTTY carrier oscillator shift jack, carrier oscillator output jack, PTO lamp jack, microphone jack, key jack, anti-VOX/sidetone gain control, VOX gain control, VOX delay control-cw, and VOX delay control-ssb a-m.

C-Line Accessories

Model No. 1511

Drake MS-4 Matching Speaker

(Shown on facing page) for use with R-4, R-4A, R-4B and R-4C Receivers. (Has space to house AC-3 and AC-4 Power Supplies).

Power Supplies for T-4, T-4X, T-4XB or T-4XC (The AC-4 can be housed in an MS-4 speaker cabinet).
Model No. 1501 Drake AC-4
Model No. 1505 Drake DC-4

Accessory Bandwidth Filters available: Model No. 7011 Drake FL250, Model No. 7013 Drake FL500, Model No. 7015 Drake FL1500, Model No. 7017 Drake FL4000, Model No. 7019 Drake FL6000.

Linear Amplifier see page 15

RF Wattmeters see page 3

Matching Networks and FS-4 Synthesizer see page 14

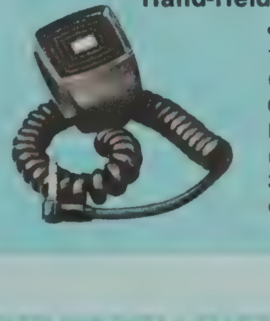
Push Button Encoding Mike see page 20

DRAKE MICROPHONES

Wired for use with Drake transmitters and transceivers, for either push-to-talk or VOX. Type of operation is determined by the VOX control setting of the transmitter.

Desk Type Model No. 7075

• **Type:** Heavy Duty Ceramic Desk Top • **Cable:** Four Foot, 3-Conductor, One Shield • **Output Level:** Minus 54 dB (0 dB = 1 volt/microbar) • **Frequency Reponse:** 80-7000 Hz • **Switching:** Adapts to either push-to-talk or VOX.



Hand-Held Type Model No. 7072

• **Type:** Ceramic, hand held • **Cable:** 11″ Retracted, 5′ extended, PVC 3 Cord, 1 shielded, Coil Cord • **Case:** Cycolac • **Finish:** Grey • **Output Level:** Minus 65 dB (0 dB = 1 volt/microbar) • **Frequency Response:** 300-3000 Hz • **Switching:** Adapts to either push-to-talk or VOX.

DRAKE® C-LINE ACCESSORIES

Model No. 1520

Drake FS-4 Digital Synthesizer

The new solid state Drake FS-4 Synthesizer opens the door to a new world of continuous-tuning short wave! Combines synthesized general coverage flexibility with the selectivity, stability, frequency readout and reliability of the Drake R-4C or SPR-4 Receivers.

• Interfaces with all R-4 series receivers and T-4X series transmitters: (R-4, R-4A, R-4B, R-4C, SPR-4, T-4, T-4X, T-4XB and T-4XC), without modification. • MHz range is set on FS-4, with kHz readout taken from receiver dial. • Complete general coverage—no range crystals to buy. • T-4/T-4X series transmitters transceive on any FS-4 frequency, when used with R-4 series receivers. • Readout 1 kHz with Drake PTO.

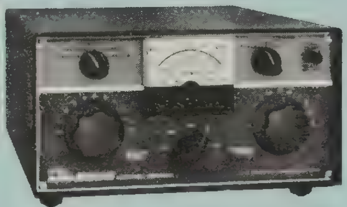
R-4C/FS-4: • Passband Tuning, Notch Filter, optional Selectable 8-pole Crystal Filter for optimum selectivity. • Continuous coverage 1.5 MHz through 30 MHz.

SPR-4/FS-4: • All solid state • Built-in L/C Filter for selectivity on am, cw, usb and lsb. • Versatile combination includes low frequency Marine and Broadcast band. • Continuous coverage 150 kHz-30 MHz. • For use with SPR-4, order Interface Kit Model 1523.

Model No's
1507 & 1509

Drake MN-4 & MN-2000 Matching Networks

MN-4 (Model No. 1507)



MN-2000 (Model No. 1509)

A Drake matching network is a worthwhile addition to any amateur station where peak performance is desired. Basically identical, except for power handling capabilities, the MN-4 and MN-2000 enable feedline SWR's of 5:1 to be matched to the transmitter. If input impedance is purely resistive, even higher SWR's can be handled. • Besides presenting a 50 ohm load to the transmitter, the Matching Network's built in rf wattmeter allows accurate and continuous power measurement and VSWR indication. The advanced wattmeter circuitry yields frequency-insensitive readings from 2 to 30 MHz, and accuracy until now obtainable only in expensive wattmeters.

DRAKE MN-4 & MN-2000 SPECIFICATIONS

Frequency Coverage:	3.5 to 4.0 MHz, 7.0 to 7.3 MHz, 14.0 to 14.35 MHz, 21.0 to 21.45 MHz, 28.0 to 29.7 MHz	
Input Impedance:	50 ohms (resistive)	
Load Impedance:	50 ohm coax with VSWR of 5:1 or less (any impedance angle) 75 ohm coax at a lower VSWR can be used.	
Meter:	Reads forward power in watts, or VSWR	
Insertion Loss:	0.5 dB or less on each band after tuning	
	MN-4	**MN-2000**
Power Capability:	200 watts rf continuous	1000 watts rf average continuous duty, 2000 watts PEP
Wattmeter Accuracy:	± (5% of reading + 1% of full scale)	
Dimensions: (including connectors)²	5.5″H x 10.8″W x 8.5″D (14 x 27.3 x 21.6 cm)	5.5″H x 10.8″W x 14.4″D (14 x 27.3 x 36.5 cm)
Shipping: Weight: Dimensions:	9 lbs (4.1 kg) 11.8″ x 8″ x 10.3″ (29.8 x 20.3 x 26 cm)	18 lbs (8.2 kg) 18″ x 9″ x 15″ (45.7 x 22.9 x 38.1 cm)
FRONT PANEL CONTROLS	Resistive Tuning, Reactive Tuning, VSWR Calibration, Bandswitch, Watts/VSWR Selector Switch	
	—	Antenna/Dummy Load Switch
REAR PANEL	Ground Post and three SO-239 Connectors: one input, two outputs	Ground Post and four SO-239 connectors: One input, two outputs, one Alternate Antenna/Dummy Load

(Other C-Line Accessories: see page 11.)

Model No. 1519

Drake L-4B Linear Amplifier

• **2000 watts PEP ssb—1000 watts dc input power on cw, a-m, and RTTY.** Massive plate transformer, large heavy duty plate tank components and voluminous cooling system insure continuous operation at these ratings. • **High-efficiency Class B Grounded Grid Circuit** uses the new Eimac 3-500Z zero bias triodes. These tubes have a total plate dissipation rating of 1000 watts and their rugged construction withstands abuse. • **A broadband tuned input circuit** is employed on each band for minimum distortion, higher efficiency and a 50 ohm input impedance. • **Vernier Drive** on the plate tuning control for easy plate tuning. • **New Epoxy Finish** and eye-ease front panel. • **The L-4B Linear Amplifier matches TR-4 series transceivers and T-4 and T-4X series transmitters** in appearance and drive requirements to run the maximum legal input power. Any exciter that can deliver 100 watts PEP ssb and 75 watts on cw will be able to drive the L4B to the maximum legal input power. An advantage of the grounded grid circuit is that most of the driving power adds to the output power. • **Two taut-band suspension meters** indicate plate current, grid current, plate voltage, forward and reflected r-f power. The plate current meter time constant is consistant with FCC regulations. • **A transmitting agc circuit** controls the exciter gain to allow the highest average power without peak clipping. A front panel adjustment is provided to set the threshold level for optimum operation of different exciters. • **A standby switch** on the L4B allows the L4B to remain "On" while operating with the exciter only. • **Rf negative feedback** decreases distortion to better than 35 dB and tends to equalize tube characteristics from tube to tube and from brand to brand. • **Built-in rf directional wattmeter** calibrated 300 and 3000 watts forward and 300 watts reflected. • **An internal changeover relay** feeds the antenna through when on "Receive", "Standby", or when power is off. A pair of relay contacts bias the output tubes to cutoff, eliminating unwanted heat and diode noise when receiving. • **A quiet, internal blower**—low velocity, high volume. Effectively cools tube base seals, envelopes, and plate seals.

• **L-4B includes tubes, chimneys and a solid state power supply** which provides excellent dynamic and static voltage regulation. The power supply is separate to keep the weight off the operating desk and to make a more flexible installation.

DRAKE L-4B SPECIFICATIONS

• **Frequency Coverage**—Ham bands 80 through 10 meters. All frequencies 3.5 to 30 MHz may be covered with alteration of input coils. • **Plate Input**—2000 watts PEP—ssb, 1000 watts dc on cw, a-m and RTTY. • **Drive Requirements**—100 watts PEP—ssb, 75 watts cw, a-m and RTTY. • **Input Impedance**—50 ohms. • **Output Impedance**—Adjustable pi-network matches 50 ohm line with SWR not to exceed 2:1. • **Wattmeter Accuracy**—300 watts forward and reflected, ± (5% of reading + 3 watts). 3000 watts forward, ± (5% of reading + 30 watts). • **Power Requirements**—230 volts 50—60 cycles 15 amperes, or 115 volts 50—60 cycles 30 amperes. • **Dimensions—Amplifier** 14"W x 7.9"H x 14.4"D (35.4 x 20 x 36.4 cm), **Power Supply** 6.8"W x 7.9"H x 11"D (17.1 x 20 x 27.9 cm). • **Weight—Amplifier** 32 lbs (14.5 kg), **Power Supply** 43 lbs (19.5 kg). • **Tube Complement**—Two 3-500Z (Two 8163 or Two 3-400Z can be used). • **Shipping Wt & Size: Power Supply** 48 lbs (21 kg), 11.5" x 11" x 13.5" (29.2 x 27.9 x 34.3 cm); **Amplifier** 42 lbs (19.1 kg), 21" x 12" x 17" (53.3 x 30.5 x 43.2 cm).

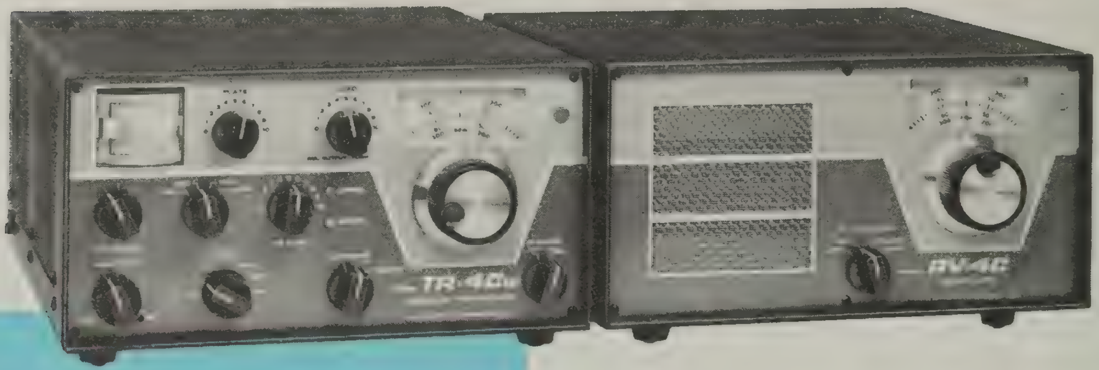
FRONT PANEL CONTROLS

• **On-Off**—Rocker Switch. • **Ssb-Cw/Tune**—Rocker switch changes plate voltage for different modes of operation. • **Band**—Switch selects desired ham bands (See Frequency Coverage). • **Plate and Load**—Tuning adjust pi-network capacitors in tank circuit for proper resonance and loading on all bands. • **Meter**—Switch selects monitoring either grid current, plate voltage, forward or reflected rf power on the lower meter. • **Alc/Standby Push**—Transmitting agc threshold adjustment and push-pull switch that allows the L-4B to remain on while operating with the exciter only. • **Rear Jacks**—Power (connects L-4B to power supply), high voltage, VOX (for turning on L-4B with exciter VOX contacts), transmitting agc (for connecting transmitting agc to exciter), rf input (for connecting to exciter rf output), rf output (for connecting L-4B to an antenna). • **Meters**—Plate Current, Grid Current/Plate Voltage/Forward Power/Reflected Power (switch selected). • **Power Supply Controls**—Two circuit breaker reset buttons.

Model No. [illegible]

Drake TR-4Cw Sideband/Cw Transceiver

with Model No. 1319 Drake RV-4C Remote VFO



The Transceiver for All License Classes

- **500 Hz cw filter now included**
- **Ideal for the licensee in the up-graded Novice/Technician Class.**
- **Runs the full 250 watt cw input.**
- **80 thru 10 meters**
- **1 kHz dual concentric dial**
- **Excellent PTO stability**
- **Full gating noise blanker optional**
- **Transceive or separate PTO**
- **Wide range receiving agc**
- **Calibration constant mode to mode**
- **300 watts PEP input on ssb**
- **Shifted-carrier cw**
- **Upper and lower sideband**
- **Superb receiver overload and Cross-Mod characteristics**
- **VOX or PTT**
- **Output impedance adjustable**

The many years of transceiver experience and design improvements behind the Drake TR-4Cw make it one of the finest transceivers available in both circuit design and packaging. Compact and lightweight, it is ideal for mobile use, portable excursions, and vacations. Usb, lsb, cw, or a-m operations is at your finger tips.

• **300 Watts PEP** input on ssb, 260 watts input on cw. • **Complete Amateur Band Frequency Coverage:** 80 through 15 meter bands complete and 28.5-29.1 MHz of 10 meters. Rest of 10 meter band obtained with accessory crystals. • **Separate Sideband Filters:** Separate usb and lsb filters eliminate oscillator shifting and insure long term carrier vs filter alignment. • **Nominal 1.7:1 Filter Shape Factor:** These filters stand among the industry's finest with 6dB bandwidth of 2.1 kHz (chosen to slice thru QRM), 60 dB bandwidth of only 3.6 kHz and 100 dB ultimate rejection. • **Provision For Highly Effective Accessory Noise Blanker.** • **Heavy Irridited Cadmium Plated Chassis.** • **Cw Side Tone Oscillator** for monitoring your cw transmission. • **Finish:** Scratch resistant epoxy paint. • **Crystal Calibrator** built in. • **VFO Indicator Light** eliminates confusion of which main tuning knob controls the frequency when using an RV-4C remote VFO. • **Automatic Cw Transmit Receive Switching** sometimes called "semi" break-in. • **Full Agc** with Drake dual time constant system confines a 60 dB signal change to a 3 dB audio change. • **Effective Transmitting Agc** insures clean ssb output. • **Solid State Permeability Tuned VFO** for low drift and accurate 1 kHz divisions on all bands. New easy to read dual concentric dials. • **VOX or PTT** for use on a-m or ssb. • **Receiver S-Meter** automatically switches to indicate transmitting agc on transmit. • **Transmitter Plate Ammeter** indicates **Relative Rf Output** by depressing load control shaft. • **Adjustable Pi-Network** output circuit.

DRAKE TR-4Cw SPECIFICATIONS

• **Frequency Coverage:** Full coverage on all amateur bands 10 thru 80 meters, in seven 600 kHz ranges, with crystals supplied: 3.5 to 4.1 MHz, 7.0 to 7.6 MHz, 13.9 to 14.5 MHz, 21.6 MHz, 28.5 to 29.1 MHz. Accessory crystals available for 28-28.6 and 29.1-29.7 ranges. • **Solid State VFO:** Has linear permeability tuning. Tunes 4.9 to 5.5 MHz for all ranges. • **Dial Calibration:** New concentric dials. 100 kHz markings on one dial, 1 kHz division on second dial. • **Frequency Stability:** High stability solid state VFO tunes same range on all bands. Drift is less than 100 Hz after warm-up, and less than 100 Hz for plus or minus 10% line voltage change. • **Modes of Operation:** Ssb upper and lower sideband, cw and a-m. • **Power Supply Requirements:** Due to the 300 watt, PEP input rating, the TR-4Cw requires a power supply capable of low voltage at high current with very good dynamic regulation. The voltage and current requirements are as follows: 1. 650 volts at 300 mA average and 500 mA maximum with 10% regulation from 100 mA to 500 mA and maximum ripple of less than 1%. 2. 250 volts at 175 mA with 10% regulation from 150 mA to 180 mA. This includes the effect of the 650 volt supply change if both voltages are obtained from the same transformer. Maximum ripple must be less than ¼%. 3. −45 to −65 V-dc adjustable filtered bias into 33K ohm load. 4. 12.6 volt ac or dc at 5.5 amps. • **Misc:** 20 tubes including voltage regulator; two transistors; 8 diodes; 100 kHz crystal calibrator built in; **Dimensions:** 5.5″H x 10.8″W x 14.4″D (13.9 x 27.3 x 36.5 cm). **Weight:** 16 lbs (35.2 kg). **Shipping:** Dimensions; 18″ x 9″ x 15″ (45.7 x 22.9 x 38.1 cm). Weight; 21 lbs (46.2 kg).

TRANSMITTER SPECIFICATIONS:

• **Single Sideband.** 300 watts PEP input power, VOX or PTT. Two special 9 MHz crystal filters provide upper or lower sideband selection on any band, without the necessity of shifting oscillators. Unwanted sideband suppression of more than 60 dB and carrier suppression of 60 dB. Overall audio frequency response 400 to 2500 hertz at 6 dB down. Distortion products 30 dB down from maximum output. • **Cw: Power input 260 watts.** Carrier is shifted approximately 1000 hertz into one sideband, and mixer and driver are keyed. Grid block keying is free from chirps and clicks. Automatic transmit/receive switching when key is operated. Cw sidetone oscillator for monitoring. • **A-m:** Controlled carrier a-m screen modulator is built-in. 260 watts PEP input. Low carrier power increases 6 times to 50 watts output at maximum modulation. This system is compatible with ssb linears. VOX or PTT. A diode envelope detector is used in this mode. Product Detector can be used by switching manually. • **Output Impedance:** Nominal 50 ohms, adjustable with pi-network. • **Microphone Input:** High-impedance.

RECEIVER SPECIFICATIONS:

• **Sensitivity:** Less than ½ microvolt for 10 dB S/N. • **I-f Selectivity:** 2.1 kHz at 6 dB, 3.6 kHz at 60 dB or 500 Hz at 6 dB for cw reception. • **Agc:** Full agc on received modes—audio output varies less than 3 dB for 60 dB change in signal level. Any amount of agc from zero to full can be obtained by adjustment of rf gain control. Time proven Drake agc system provides fast attack and slow release with noise pulse suppression, no pumping or popping evident. • **Antenna Input:** Nominal 50 ohms. • **Audio Response:** 400 to 2500 Hz at 6 dB. • **Audio Output Power:** 3 watts. • **Impedance:** 4 ohms.

CONTROLS

• **Front Panel Controls: "Main Tuning"** has spinner knob with adjustable skirt for calibrating main dial. Tunes VFO and rotates main dial. **"RF Tune"** tunes the rf circuits common to receiver rf amplifier and transmitter driver stages. 0-10 scale. **"Plate" and "Load"** tuning adjust pi-network capacitors in transmitter for proper resonance and loading on each band. Load control also converts ammeter to relative output when pushed in. **"Band"** switch selects desired ham band (see frequency coverage). **"Function"** switch has four positions "CAL, SSB, CW, AM." "CAL" operates built-in 100 kHz crystal calibrator for accurate setting of main tuning hair line indicator and knob skirt. "SSB" provides ssb operation, either VOX or PTT. "CW" provides for cw operation with automatic transmit receive switching and cw sidetone, and is used for tune up. "AM" provides for a-m operation with VOX or PTT, and with diode detector for receiving. **"Xmtr Gain"** functions as mike audio gain on ssb and a-m, and as carrier injection control on cw for tune and cw. **"Rcvr Gain"** knob controls receiver af gain and power ON-OFF switch. Lever behind knob controls setting of rf gain. **"Sideband"** switch in conjunction with indicator lights marked **"Upper"** and **"Lower"** selects desired sideband by connecting into the circuit either the upper or lower sideband filter, or cw filter • **Right Side Screwdriver Adjust Controls:** Vox Gain, Anti-Vox Gain, S-Meter Zero. • **Right Side Jacks:** Headphone (disconnects speaker circuit), Microphone (3-circuit for PTT), Key (normally closed). • **Rear Controls:** Sidetone gain, Dial light dimmer. • **Rear Jacks:** Power (connects TR-4Cw to power supply and speaker), MUTE (for muting an external receiver), EXT RCV (for connecting an external receiver to the antenna), Antenna (for connecting the TR-4 to the antenna). • **Left Side Controls**—Transceive/External receive switch (for selecting between the use of the TR-4Cw or an external receiver.) • **Inside Controls:** Carrier balance. • **Meters:** Receiver S-meter/transmitting agc indicator and plate ammeter/relative rf output indicator.

TR-4Cw ACCESSORIES

Model No. 1319 **Drake RV-4C Remote VFO** consists of a highly stable permeability-tuned solid-state VFO, a cathode follower, control circuitry and a 5-inch 4 ohm speaker. For use with TR-3 and TR-4 series transceivers, it permits reception, transmission, or both on a frequency different from the VFO setting of the transceiver, but in the same band to which the transceiver is tuned. • **Two Controls:** Main Tuning and RV-4C Function. • The RV-4C cabinet matches the transceiver and will house an AC-4 (or AC-3) power supply. • **Size:** 5.4″H x 10.8″W x 11.2″D (13.7 x 27.3 x 28.3 cm). **Weighs:** 6.5 lbs (3 kg).

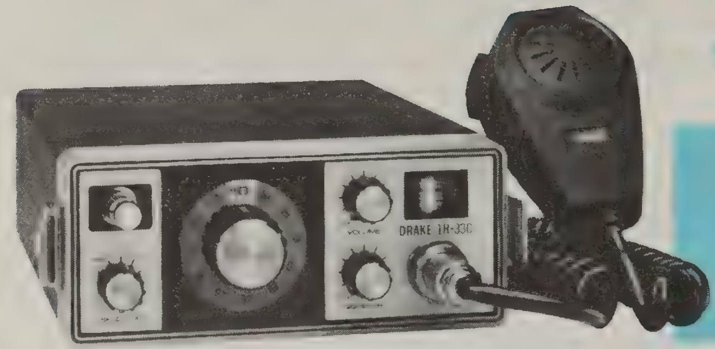
Model No. 1315 **Drake FF-1 Fixed Frequency Adapter** allows crystal control operation on Receive or Transmit or both with up to two channels.

Model No. 1501 **Drake AC-4 Power Supply,** for use with all Drake 3 or 4 series transceivers and transmitters, supplies all the required voltages with the proper filtering and regulation and may be operated from 120 or 240 volts ac, 50 of 60 Hz. Fits inside the Model MS-4 Matching Speaker or the Remote VFO unit. • **SPECIFICATIONS: Input:** 120 or 240 volts ac 50/60 Hz. • **Output:** 650 volts dc at 300 mA average (500 mA peak). 250 volts dc at 175 mA. −45 to −65 volts dc adjustable bias into 33 K ohms. 12.6 volts ac at 5.5 amperes. • **Size:** 5″H x 10″W x 4.8″D (12.7 x 25.4 x 12 cm). • **Weight:** 17.2 lbs (7.8 kg).

Model No. 1505 **Drake DC-4 Power Supply** 12 V-dc Solid State for Drake 3 and 4-series transceivers.

Model No. 1511 **Drake MS-4 Matching Speaker** (details page 11).

DRAKE® Amateur VHF FM Transceiver



[illegible] Drake TR-33C

- SCPC* Frequency Control
- Lower Receiver Battery Drain
- Expanded Portable Antenna Choice

**Single Crystal Per Channel*

• 12 Channels—only one crystal per channel provides simplex OR repeater operation on ANY channel. 2 channels supplied. 5 transmit offset positions, 3 supplied. • All FET front-end crystal filter for superb receiver intermod rejection. • Small convenient microphone included. • New lower power drain circuit on squelched receive. • Nicad rechargeable batteries supplied. • Built-in battery charger. • Ac and dc power cords supplied. • Telescoping screw-on antenna supplied, rubber helix optional. • Channel indicator light when using external dc supply. • Carry strap supplied. • Meter Indicates receive strength, xmit output, or battery voltage. • External speaker jack on rear panel. • Auxiliary jack on rear panel—may be used for tone-pad connections, etc. • Traditional R.L. Drake service backup.

ACCESSORIES

- **Model AA-10 Power Amplifier.**
- **Model AC-10 Power Supply.**
- **Accessory Crystals.**
- **Model MMK-33 Mobile Mount.**

DRAKE TR-33C SPECIFICATION'S

GENERAL: • **Frequency Coverage:** 146-148 MHz, 12 channels (2 supplied: 146.52 and 146.94). Crystal determines receive frequency. • Transmit frequency offset for repeater operation determined by 5-position switch: Simplex, +600 kHz, and −600 kHz supplied; any two additional offsets available with accessory crystals. • **Power requirements:** 13.0 volts dc ± 15% external supply OR internal battery supply. • **Current Drain (Batteries):** Squelched receive: 30 mA; transmit: 400 mA. External supply: above plus 45 mA for channel switch indicator lamp. • **Antenna:** 50 ohm external antenna through SO-239 connector OR screw-on telescoping whip antenna supplied, may be replaced with rubber helix antenna. • **Dimensions:** 5.5″ x 2.8″ x 8.5″ (13.8 x 5.8 x 21.6 cm). • **Weight:** 4.4 lbs (2 kg).

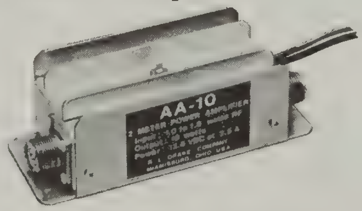
RECEIVER: • **Sensitivity:** less than .5 μV for 20 dB noise quieting. • **Selectivity:** ± 30 kHz adjacent channel rejection greater than 75 dB. • **Modulation acceptance:** at least ± 7 kHz. • **Inter modulation Rejection:** 70 dB referenced to sensitivity level. • **First i-f:** 10.7 MHz with monolithic crystal filter. • **Second i-f:** 455 kHz with ceramic filter. • **Audio Output:** nominal 1 watt at less than 10% distortion into 8 ohm built-in speaker or external speaker.

TRANSMITTER: • **Rf Output Power:** 1.5 watts nominal, with 13.0 volts dc supply. • **Frequency Deviation:** Direct frequency modulation adjustable to at least ± 7 kHz deviation, factory set at ± 5 kHz. • Separate microphone gain and deviation adjustments.

Model No. 1321

Drake AA-10 Power Amplifier

10 dB power increase greatly adds to the transmitting distance covered by and 2-meter fm transceiver running up to 1.8 watts output



Small size: 2″H x 2.1″W x 5.5″D (51 x 52 x 140 mm)

• Single stage solid-state balanced emitter vhf power transistor with VSWR protection. • Has no relays—automatic transmit/receive switching.

SPECIFICATIONS: • **Frequency Coverage:** 144-148 MHz. • **Rf Output Power:** 10 watts minimum at 13.8 volts dc and rated input power. • **Rf Input Power:** 1 watt nominal, 1.8 watt maximum. • **Receive Loss:** Fraction of 1 dB—unnoticeable. • **Connectors:** Type SO-239 Antenna and Transceiver Connectors. • **8 Semi-conductors.** • **Power Requirements:** 13.8 volts dc at 1.5 amperes.

[illegible] Drake AC-10 Power Supply

Powers the AA-10, TR-22C, TR-33C and TR-72. Simultaneously can charge the TR-22C/33C nicads. Supplies 13.8 volts up to 3 amps from 120 V-ac 60 Hz input.

Drake Crystals

Fixed Frequency: Operation with:

T-4X*	For operation below 10 MHz, Xtal.
T-4XB*	Freq. = Oper. Freq. + 5.645.
T-4XC	For operation above 10 MHz.
R-4A **R-4B**	Xtal Freq. = $\frac{\text{Oper. Freq.} + 5.645}{2}$

**Modified for fixed frequency operation*

Variable Frequency: Operation with:

T-4X **T-4XB** **T-4XC** **R-4A** **R-4B** **R-4C**	Xtal Freq. = low end of Oper. Band. in MHz + 11.1.

Crystals for:

TR-33C

Specify Transmit or Receive and Frequency

SPR-4 Crystals

Operating Frequency in MHz	Crystal Frequency in MHz	Operating Frequency in MHz	Crystal Frequency in MHz
.15 — .5*		15.0 — 15.5*	26.09
.5 — 1.0*	11.59	15.5 — 16.0	26.59
1.0 — 1.5*	12.09	16.0 — 16.5	27.09
1.5 — 2.0	12.59	16.5 — 17.0	27.59
2.0 — 2.5	13.09	17.0 — 17.5	28.09
2.5 — 3.0	13.59	17.5 — 18.0*	28.59
3.0 — 3.5	14.09	18.0 — 18.5	29.09
3.5 — 4.0	14.59	18.5 — 19.0	29.59
4.0 — 4.5	15.09	19.0 — 19.5	30.09
4.5 — 5.0	15.59	19.5 — 20.0	30.59
5.0 — 5.5	16.09	20.0 — 20.5	31.09
5.5 — 6.0	16.59	20.5 — 21.0	31.59
6.0 — 6.5*	17.09	21.0 — 21.5	32.09
6.5 — 7.0	17.59	21.5 — 22.0*	32.59
7.0 — 7.5*	18.09	22.0 — 22.5	33.09
7.5 — 8.0	18.59	22.5 — 23.0	33.59
8.0 — 8.5	19.09	23.0 — 23.5	34.09
8.5 — 9.0	19.59	23.5 — 24.0	34.59
9.0 — 9.5	20.09	24.0 — 24.5	35.09
9.5 — 10.0*	20.59	24.5 — 25.0	35.59
10.0 — 10.5	21.09	25.0 — 25.5	36.09
10.5 — 11.0	21.59	25.5 — 26.0	36.59
11.0 — 11.5	22.09	26.0 — 26.5	37.09
11.5 — 12.0*	22.59	26.5 — 27.0	37.59
12.0 — 12.5	23.09	27.0 — 27.5	38.09
12.5 — 13.0	23.59	27.5 — 28.0	38.59
13.0 — 13.5	24.09	28.0 — 28.5	39.09
13.5 — 14.0	24.59	28.5 — 29.0	39.59
14.0 — 14.5	25.09	29.0 — 29.5	40.09
14.5 — 15.0	25.59	29.5 — 30.0	40.59

*SPR—4 normally supplied with these operating frequencies.

Crystal Frequencies for Equipment Working through Repeaters

Drake stocks TR-33C cystals for the following frequencies which are normally available for immediate shipment. Crystals for other frequencies usually require approximately four weeks delivery.

Repeater Frequencies

Frequency in MHz	
Transmit†	**Receive**
146.01	146.61
146.04	146.64
146.07	146.67
146.10	146.70
146.13	146.73
146.16	146.76
146.19	146.79
146.22	146.82
146.25	146.85
146.28	146.88
146.31	146.91
146.34	146.94
146.37	146.97

Simplex Frequencies

Frequency in MHz	
Transmit†	**Receive**
146.40	146.40
146.43	146.43
146.46	146.46
146.49	146.49
146.52	146.52
146.55	146.55
146.58	146.58

NOTE: Orders for crystals outside the 2 Meter Band will not be accepted.

†Standard Repeater and Simplex frequencies. Separate Transmit Crystals are not needed for the TR-33C since it uses a single Crystal per channel and has built-in standard Transmit offsets. Special offsets available.

SPR-4 CRYSTAL KITS

Amateur Bands—160m, 80m, 20m, 15m and 10m ranges. Six crystals cover:

1.5 — 2.0 MHz
3.5 — 4.0
14.0 — 14.5
21.0 — 21.5 MHz
28.0 — 28.5
28.5 — 29.0

Marine Bands—Eleven crystals cover:

2.0 — 2.5 MHz
2.5 — 3.0
4.0 — 4.5
8.0 — 8.5
8.5 — 9.0 MHz
12.0 — 12.5
13.0 — 13.5
16.5 — 17.0
17.0 — 17.5 MHz
22.0 — 22.5
22.5 — 23.0

Aeronautical Overseas—Seven crystals cover:

2.5 — 3.0 MHz
3.0 — 3.5
4.5 — 5.0
5.5 — 6.0
6.5 — 7.0 MHz
8.5 — 9.0
13.0 — 13.5

Time & Frequency Standard, WWV— Five crystals cover:

2.5 — 3.0 MHz
5.0 — 5.5
10.0 — 10.5
15.0 — 15.5 MHz (orginal equipment)
20.0 — 20.5
25.0 — 25.5

Citizens Band—One crystal and Frequency chart:

27.0 — 27.5 MHz* (*Generous overtravel gives additional 50 kHz or more off ends of each range).

Tropical Broadcast—Three crystals cover:

2.0 — 2.5 MHz
3.0 — 3.5 MHz
4.5 — 5.0 MHz

MARS—Five crystals cover:

2.0 — 2.5 MHz
3.0 — 3.5
4.0 — 4.5 MHz
5.0 — 5.5
18.0 — 18.5 MHz

Teletype Commercial—UPI, AP, Stock Market, Weather, etc.—Four crystals cover:

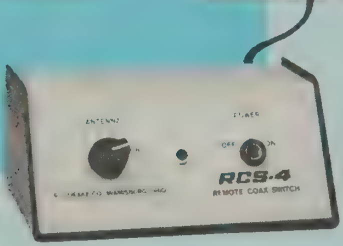
7.5 — 8.0 MHz
9.0 — 9.5
13.5 — 14.0 MHz
15.5 — 16.0

Remote Coax Switch

Model No. 1518

Drake RCS-4

- **Remotely Selects One of Five Antennas**
- **Grounds All Unused Antennas**
- **Grounds All Antennas in Gnd Position for Lightning Protection**
- **Front Panel Indicator Monitors Antenna Selection Interval**
- **Protected Against Adverse Weather Conditions**
- **SO-239 Connectors Provided for Main Coax Feed-Line and Individual Antenna Feed-Lines**
- **Handles 2000 Watts PEP**
- **Available in 120 V-ac or 240 V-ac 50/60Hz Versions**



• Control unit works on 110/220 V-ac, 50/60 Hz, and supplies necessary voltage to motor. • Excellent for single coax feed to multiband quads or arrays of monobanders. The five positions allow a single coax feed to three beams and two dipoles, or other similar combinations. • Control cable (not supplied) same as for HAM-M rotator. • Selects antennas remotely, grounds all unused antennas. Gnd position grounds all antennas when leaving station. "Rain-Hat" construction shields motor and switches. • Up to 30 MHz, insertion of switch changes VSWR no more than 1.05:1. • From 30 MHz to 150 MHz, insertion changes VSWR no more than 1.5:1. • Motor: 24 V-ac, 2 amp. Lubrication good to −40°F. • Switch Rf Capability: Maximum legal limit.

Push Button Encoding Mike

Model No. 1525

Drake 1525EM

- Microphone and auto-patch encoder in single convenient package with coil cord and connector. Fully wired and ready for use.
- High accuracy IC tone generator, no frequency adjustments.
- High reliability Digitran® keyboard.
- Power for tone encoder obtained from transceiver through microphone cable. No battery required. Low current drain.
- Low output impedance allows use with almost all transceivers.
- Four pin microphone plug: directly connects to Drake TR-33C without any modification in transceiver. Compatible with all previous Drake and other 2 meter units with minor modifications.
- Tone level adjustable.
- Hang-up hook supplied.

SPECIFICATIONS:

• **Microphone Element Type:** Low impedance dynamic • **Frequency Response:** 300-5000 Hz • **Output Impedance:** 500 ohms • **Microphone Output Level:** −72 dBm per microbar. Approx 3mV (−47dBm) with average voice level • **Tone Encoder:** Single integrated circuit dual tone synthesizer • **Encoder Audio Level:** Adjustable from approx 1mV to 5mV with internal potentiometer • **Encoder Frequency Tolerance:** Better than ±1% from −20°C to +50°C • **Encoder Supply Voltage:** 7.5 to 15 Volts (Obtained through microphone cable from transceiver) • **Encoder Current Drain:** 5 to 20 mA depending on supply voltage • **Encoder Keyboard:** High reliability Digitran® keyboard • **Microphone Hanger:** Hook supplied • **Dimensions:** 2.6" x 3.5" x 1.7" (6.6 x 8.9 x 4.3 cm) • **Weight:** 8 oz. (.227 kg)

Drake 1525EM, microphone with tone encoder and connector for TR-33C, TR-72, TR-22C, ML-2

Drake 7073DM as above but without tone encoder

R. L. DRAKE COMPANY DRAKE®

540 Richard St., Miamisburg, Ohio 45342
Phone: (513) 866-2421 • Telex: 288-017

Western Sales and Service Center, 2020 Western Street, Las Vegas, Nevada 89102 • 702/382-9470

LITHO IN U.S.A.

TVI MAY BE ELIMINATED WITH THESE DRAKE FILTERS

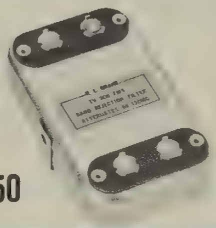
TV-300-HP High Pass Filter

provides more than 40 db attenuation at 52 MC and lower. Protects the TV set from amateur transmitters 6 thru 160 meters.

$4.50

TV-300-FMS, 88 to 108 Mc Band Stop Filter

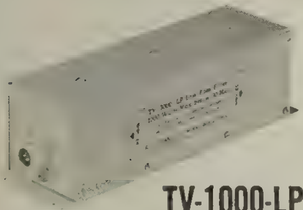
FM broadcast transmitters are responsible for considerable TV interference being blamed on radio amateurs. A Drake TV-300-FMS installed in TV antenna lead will clear up entire FM band, no adjustment required.



$4.50

Drake Amateur Low Pass Filters

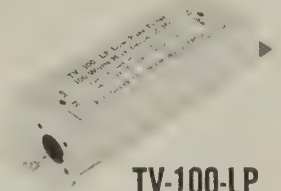
. . . have four pi sections for sharp cut-off between 6 meters and channel 2, and to attenuate xmtr harmonics falling in any TV channel and the FM band. 52-ohm.



TV-1000-LP

rated 1000 watts input, 200 watts on 6 meters. SO-239 connectors built-in.

$16.95



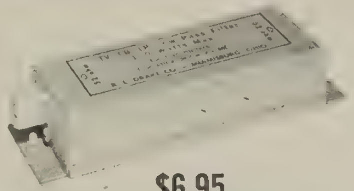
TV-100-LP

rated 100 watts input, 20 watts on 6. Solder it in or use your own SO-239's.

$5.95

TV-CB-LP Citizens Band Low Pass Filter

is a four section filter designed with 43.2 MC cut-off and extremely high attenuation in all TV channels for citizens band and other transmitters 30 MC and lower. Rated 100 watts input. SO-239 connectors built-in.



$6.95

$4.50

LN-4 Line Filter

Isolates transmitter or TV set from RF on power line. Attenuates 500 KHz to over 200 MHz. 125 VAC, 6 amps max.

R. L. DRAKE COMPANY
MIAMISBURG, OHIO 45342

DRAKE Equipment for Radio Communications

HAMS SAY . . .

"Best Receiver Buy since the 2-B!"

2-C RECEIVER

Excellent performance at low cost

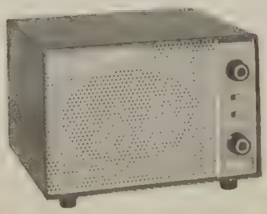
$229⁰⁰
Amateur Net

● **Triple Conversion** ● **Crystal-controlled First Converter** ● **500 kc ranges** for 80, 40, 20, 15 and 10 Meters ● **Also any 500 kc range** between 3.0 mc and 30 mc by inserting an accessory Crystal ● **Temperature-compensated VFO Tuning** ● **Selectable Sidebands** without retuning ● **Three Bandwidths**—.4, 2.4, 4.8 kc at 6 db ● **Solid-state** Audio, Product and AM Detectors, AVC Amp and Xtal Osc ● **AVC Switch** (Fast, Slow and Off) ● **SSB, AM and CW** with AVC and S-meter ● **Works Break-in CW** with 2-NT Xmtr ● **19 Tubes and Semi-Conductors** ● **Dimensions:** 11⁵⁄₁₆"W x 6⁹⁄₃₂"H x 9³⁄₃₂"D. **Wt.:** 13½ lbs.

Accessories available: 100 kc Calibrator, Q Multiplier, Matching Speaker, Noise Blanker, Crystals for other ranges.

2-CQ Speaker/Q-Multiplier & Notch Filter

$39.95 Amateur Net



Plugs into a socket on the 2-C to provide increased selectivity and notching out of interfering hetrodynes and other interfering signals. Necessary controls are mounted on the 2-CQ.

[illegible]

DRAKE 4 LINE *Superior performance—versatility!*

R-4B
RECEIVER

Versatility . . .
Accuracy . . .
Dependability . . .

• **Linear permeability tuned VFO** with 1 kc dial divisions. VFO and crystal frequencies pre-mixed for all-band stability • **Covers ham bands** 80, 40, 20, 15 meters completely and 28.5 to 29.0 Mc of 10 meters with crystals furnished • **Any ten 500 kc ranges between 1.5 and 30 Mc** can be covered with accessory crystals for 160 meters, MARS, etc. (5.0-6.0 Mc not recommended) • **Four bandwidths of selectivity,** 0.4 kc, 1.2 kc, 2.4 kc and 4.8 kc • **Passband tuning** gives sideband selection, without retuning • **Noise blanker that works on CW, SSB, and AM** is built-in • **Notch filter and 25 Kc crystal calibrator** are built-in • **Product detector** for SSB/CW, **diode detector** for AM • **Crystal Lattice Filter** gives superior cross modulation and overload characteristics • **Solid State Permeability Tuned VFO** • 10 tubes, 10 transistors, 17 diodes and 2 integrated circuits • **AVC** for SSB or high-speed break-in CW • **Excellent Overload and Cross Modulation characteristics** • **Dimensions:** 5½"H, 10¾"W, 12¼"D. **Wt.:** 16 lbs.

$430.00

T-4XB
TRANSMITTER

Use VFO of either R-4B or T-4XB for transceiving or separately.

• **Covers ham bands** 80, 40, 20, 15 meters completely and 28.5 to 29.0 Mc of 10 meters with crystals furnished; MARS and other frequencies with accessory crystals, except 2.3-3, 5-6, 10.5-12 Mc. • **Upper and Lower Sideband** on all frequencies • **Automatic Transmit Receive Switching on CW** (semi break-in) • **Controlled Carrier Modulation for AM** is completely compatible with SSB linear amplifiers • **VOX or PTT** on SSB and AM built-in • **Adjustable Pi-Network Output** • **Two 8-pole Crystal-Lattice Filters** for sideband selection, 2.4 kc bandwidth • **Transmitting AGC** prevents flat topping • **Shaped Grid Block Keying** with side tone output • **200 Watts PEP Input on SSB**—200 watts input CW • **Meter indicates plate current and relative output** • **Compact size; rugged construction** • **Solid State Permeability Tuned VFO** with 1 kc divisions • **Solid State HF Crystal Oscillator** • **11 Tubes, 3 Transistors and 12 diodes** • **Dimensions:** 5½"H, 10¾"W, 12¼"D. **Wt.:** 14 lbs.

$430.00

2-NT
CW TRANSMITTER

Built-in essentials and accessories

$129.00

• **100 Watts Input** (can be reduced to 75 watts for novice) • **Operates Break-in CW, Semi Break-in CW or Manual CW** with Drake 2-C or other receivers • **Automatic Transmit Switching** • **Side Tone Oscillator** built in • **Antenna Change-over Relay** built in • **Pi-Network output** with fixed loading • **Lo Pass Filter** against TVI built in • **Drop-out delay** of change-over relay adjustable • **CW Coverage** on 80, 40, 20, 15, 10 Meters • **Simplified Tuning** • **Frequency Spotting** without xmtr output • **Grid Block Keying** • **Code Practice** in stand-by position • **13 Tubes and Semi-Conductors** • **Dimensions:** 9⅞"W x 6⁹⁄₃₂"H x 9⁹⁄₃₂"D. **Wt.:** 12½ lbs. **Accessories available:** Antenna Matching Network, and Crystals.

T-4B TRANSMITTER **$350.00**

Similar to T-4XB except operates with R-4B in transceive mode, or crystal control from 10 switch selectable accessory crystals. Has built-in speaker for R-4B.

4-LINE ACCESSORIES

Standard Crystals for T-4XB or R-4B **$5.00**

AC Power Supply, Model AC-4 for T-4XB or T-4B **$99.95**
(Can be housed in MS-4 Cabinet.)

Matching Speaker MS-4 $19.95

5" x 7" heavy magnet speaker. Space for power supply. Wt. 6 lbs. Size: 5⅜"H, 10¾"W, 11⅛"D.

All prices are amateur net

L-4B LINEAR AMPLIFIER

Nothing halfway about the Drake

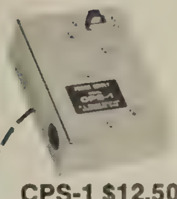
Built for continuous duty at full capacity

●**2000 Watts PEP-SSB**; 1000 Watts AM, CW, RTTY ● **Class B Grounded-Grid**—two 3-500Z Tubes ● **Broad Band Tuned-Input** for low distortion, high efficiency ● **RF Negative Feedback** gives lower distortion● **Transmitting AGC** for higher audio level without clipping ● **Directional Wattmeter** measures forward and reflected power ● **Two Taut-band Suspension Meters** ● Plate Current Meter time constant is consistent with FCC Regulations ● **Solid state Power Supply** is separate ● **Quiet,** low-velocity, high-volume Blower ● The simple uncomplicated circuitry, the rugged tubes and the massive construction assures long, trouble-free life ● **L-4B** $13\frac{15}{16}$"W, $7\frac{7}{8}$"H, $14\frac{5}{16}$"D. **Wt.:** 32 lbs. ● **Power Supply:** $6\frac{3}{4}$"W, $7\frac{7}{8}$"H, 11"D; **Wt.:** 43 lbs.

The buy of a lifetime . . . to last a lifetime

$\$695^{00}$ **including Power Supply**

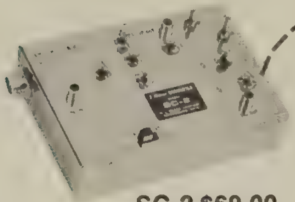
For 2 and 6 Meters DRAKE FET CONVERTERS



CPS-1 $12.50
Power Supply
for SC-2 & SC-6

SC-6 $64.50
for 6 meters

CC-1 $24.50
Converter Console



SC-2 $69.00
for 2 meters

SCC-1 $24.50
VHF Xtal Calibrator

General, SC-2 and SC-6: ● Low noise ● Improved cross modulation performance ● Uniform gain across band ● Entirely solid-state ● Zener regulated crystal oscillator ● Improved image rejection ● Low spurious response.

CPS-1 ● Silicon diode bridge circuit.

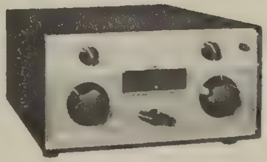
SCC-1 ● Crystal controlled 100 KHz FET Oscillator ● **Integrated circuit divider** gives 50 KHz markers up to 432 Mc.

CC-1 ● Has space for both 2 and 6 meter Converters, Power Supply, Crystal Calibrator and extra converter ● **Switch position** permits receiver to be used direct ● **Size:** $5\frac{3}{8}$"H, $10\frac{3}{4}$"W, 8"D.

MATCHING NETWORKS

MN-4
$90.00
200
watts

MN-2000
$160.00
2000
watts
PEP



General: ● **Integral Wattmeter** reads forward power in watts and VSWR directly; can be calibrated to read reflected power ● **Matches 50 ohm transmitter output** to coax antenna feedline with VSWR of up to 5:1 ● Covers ham bands 80 thru 10 meters ● **Size:** $5\frac{1}{2}$"H, $10\frac{3}{4}$"W, 8"D (MN-2000, $14\frac{3}{8}$"D) ● **Switches in or out** with front panel switch.

● **Continuous Duty Output:** MN-4, 200 watts; MN-2000, 1000 watts (2000 watts PEP) ● **MN-2000 only:** Up to 3 antenna connectors selected by front panel switch.

W-4
RF Wattmeter
$49.50

Reads forward and reflected power directly in watts (VSWR from nomogram). Two scales in each direction. 200 and 2000 watts full scale. Calibration accuracy ± (5% of reading + 2 watts) on 200 watt scale; ± (5% of reading + 20 watts) on 2000 watt scale. **Size:** $5\frac{1}{2}$" H x $3\frac{3}{4}$" W x 4" D.

Prices and specifications subject to change without notice.

TR-4

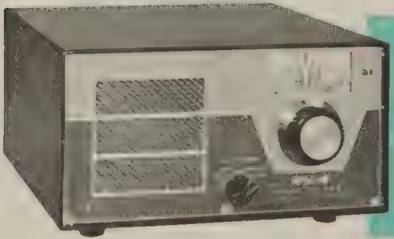
SIDEBAND TRANSCEIVER

GENERAL: • **All amateur bands** 10 thru 80 meters in seven 600 kc ranges • **Solid State VFO** with 1 kc dial divisions • **Modes** SSB Upper and Lower, CW and AM • **Built-in Sidetone** and automatic T/R switching on CW • **30 tubes and semi-conductors** • **Dimensions:** 5½″H, 10¾″W, 14⅜″D. **Wt.:** 16 lbs.

TRANSMIT: • **VOX or PTT** on SSB or AM • **Input Power:** SSB, 300 watts P.E.P.; AM, 260 watts P.E.P. controlled carrier compatible with SSB linears; CW, 260 watts • **Adjustable pi-network.**

RECEIVE: • **Sensitivity** better than ½ uV for 10 db S/N • **I.F. Selectivity** 2.1 kc @ 6 db, 7.5 kc @ 60 db. • **AGC** full on receive modes, variable with RF gain control, fast attack and slow release with noise pulse suppression • **Diode Detector** for AM reception.

$\$599^{95}$



RV-4

REMOTE VFO

Permits reception, transmission, or transceiver operation on separate frequency in same band to which the TR-4 is tuned, without retuning TR-4 VFO. Includes 5-inch speaker, 3-foot cable, and space for AC Power Supply. **Dimensions:** 5⅜″H, 10¾″W, 11⅛″D. **Wt.:** 8½ lbs.

$\$99^{95}$

TR-4 ACCESSORIES

MMK-3 Mobile Mounting Kit	**$ 6.95**
Power Supplies	
AC-4	**$ 99.95**
DC-4	**$125.00**
MS-4 Matching Speaker	**$ 19.95**
FF-1 Fixed Frequency Adapter	**$ 24.50**

Crystal Control Unit plugs into and sits under TR-4. Gives two channels in ham bands.

TR-44B

COMMUNICATIONS STATION

Less Power Supply and Crystals

$\$795^{00}$

The TR-44 package was conceived to satisfy the communications requirements of a government contractor in the Southeast Asia area. It consists of an R-4B Receiver and T-4B Transmitter in the same cabinet with built-in speaker.

• Covers ham bands; plus any ten 500 kc ranges between 1.8 and 30 mc (except 5.0-6.0 and 11.0-11.5 mc), can be covered with accessory crystals or any ten fixed frequency channels from 1.8 to 30 Mc (except 5.0-6.0 Mc) for 160 meters, Mars, Semi-Military, Government, Commercial, etc. • Transceives on frequency determined by permeability tuned VFO with 1 kc dial accuracy or by crystal • Transmits and receives on different frequencies if transmitter is crystal controlled • 200 watts PEP input on USB, LSB or AM— 200 watts semi break in CW.

Stacking Assembly only, for R-4B and T-4B (T-4XB) **$15.00**

Direct Frequency Dialing

SW-4A

International Short Wave Broadcast RECEIVER

• Ultra-precision tuning dial accuracy • Also accurately tunes standard AM Broadcast • Crystal lattice filter for adjacent station rejection and good audio frequency response • Dual conversion • Solid state AF output gives low distortion good frequency response • S-meter for signal strength indication • Preselector gives superior sentitivity by peaking antenna and RF stages • Crystal H. F. Oscillator for exceptional stability on all ranges • Amplified AVC—gives constant AF output for all signal strengths.

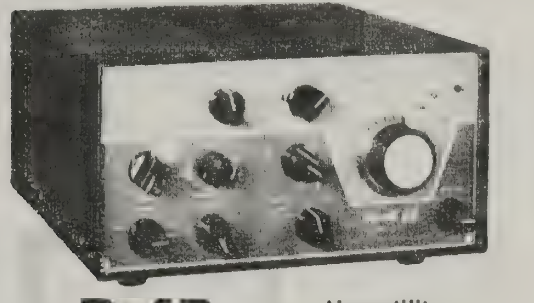
FREQUENCY COVERAGE—.15-.5, .5-1.0, 1.0-1.5, 6.0-6.5, 7.0-7.5, 9.5-10.0, 11.5-12.0, 15.0-15.5, 17.5-18.0, 21.5-22.0, and 25.5-26.0 megacycles with crystals supplied. These frequencies cover European LF, American MF and International SW Broadcast Bands. **SIZE**—5½″ high, 10¾″ wide, cabinet depth 11⅝″, overall 12¼″. **WT.**—16 lbs.

$\$289^{00}$

ACCESSORIES—Models MS-4 Speaker **$19.95** and **AL-4** Shielded Directional Loop Antenna for .5-1.5 MC **$19.95.**

All prices in this brochure are Amateur Net and subject to change without notice.

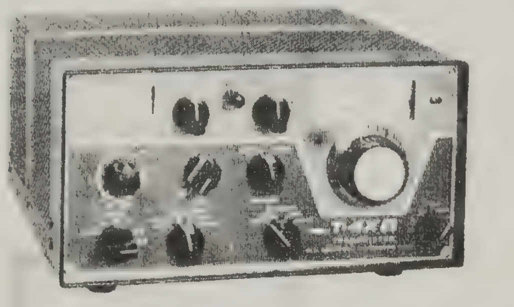
DRAKE 4-LINE *Superior performance—versatility!*



R-4B
RECEIVER

Versatility . . .
Accuracy . . .
Dependability . . .

• **Linear permeability tuned VFO** with 1 kc dial divisions. VFO and crystal frequencies pre-mixed for all-band stability • **Covers ham bands** 80, 40, 20, 15 meters completely and 28.5 to 29.0 Mc of 10 meters with crystals furnished • **Any ten 500 kc ranges between 1.5 and 30 Mc** can be covered with accessory crystals for 160 meters, MARS, etc. (5.0-6.0 Mc not recommended) • **Four bandwidths of selectivity**, 0.4 kc, 1 2 kc, 2.4 kc and 4.8 kc • **Passband tuning** gives sideband selection, without retuning • **Noise blanker that works on CW, SSB, and AM** is built-in • **Notch filter and 25 Kc crystal calibrator** are built-in • **Product detector** for SSB/CW, **diode detector** for AM • **Crystal Lattice Filter** gives superior cross modulation and overload characteristics • **Solid State Permeability Tuned VFO** • 10 tubes, 10 transistors, 17 diodes and 2 integrated circuits • **AVC** for SSB or high-speed break-in CW • **Excellent Overload and Cross Modulation characteristics** • **Dimensions:** 5½"H, 10¾"W, 12¼"D. **Wt.:** 16 lbs.



T-4XB
TRANSMITTER

Use VFO of either R-4B or T-4XB for transceiving or separately.

• **Covers ham bands** 80, 40, 20, 15 meters completely and 28.5 to 29.0 Mc of 10 meters with crystals furnished; 160 M and other frequencies with accessory crystals, except 2.3-3, 5-6, 10.5-12 Mc. • **Upper and Lower Sideband** on all frequencies • **Automatic Transmit Receive Switching on CW** (semi break-in) • **Controlled Carrier Modulation for AM** is completely compatible with SSB linear amplifiers • **VOX or PTT** on SSB and AM built-in • **Adjustable Pi-Network Output** • **Two 8-pole Crystal-Lattice Filters** for sideband selection, 2.4 kc bandwidth • **Transmitting AGC** prevents flat topping • **Shaped Grid Block Keying** with side tone output • **200 Watts PEP Input on SSB**— 200 watts input CW • **Meter indicates plate current and relative output** • **Compact size; rugged construction** • **Solid State Permeability Tuned VFO** with 1 kc divisions • **Solid State HF Crystal Oscillator** • **11 Tubes, 3 Transistors and 12 diodes** • **Dimensions:** 5½"H, 10¾"W, 12¼"D. **Wt.:** 14 lbs.

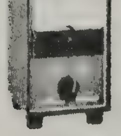
SPR-4
Solid
State

PROGRAMABLE
RECEIVER

The SPR-4 outperforms the best tube receiver, and has all advantages of solid state design . . . low power consumption, high stability and reliability. It is a general purpose rcvr, programable for any interest . . . SWL, Ham, lab, BC, marine, etc. • **Only FETs** in signal path • **Linear VFO** with 1 kHz readout • **Covers 150-500 kHz plus any 23 ranges (500 kHz wide) .500-30 MHz** • **10 ranges furnished,** others $5.00 each • **Coverage easily changed** • **3 band-widths:** 0.4, 2.4 and 4.8 kHz for CW, SSB and AM • **Built-in spkr** • **Notch filter** • **115 or 220 VAC, or 12 VDC** • **Dimens:** 10¾" W x 5½" H x 12¼" D, **Wt.** 14 lbs.

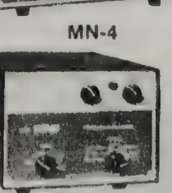
ACCESSORIES: Noise Blanker, 100 kHz Calibrator, MS-4 Speaker, AL-4 Loop Antenna for .15-1.5 MHz, Transceive Adaptor (T-4XB), DC Power Cord, Crystals.

4-Line Accessories



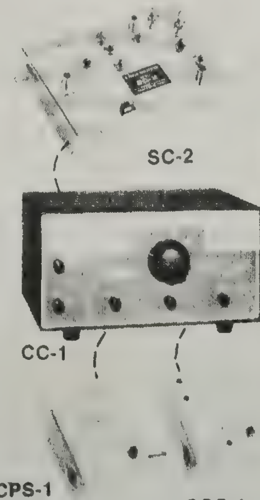
W-4

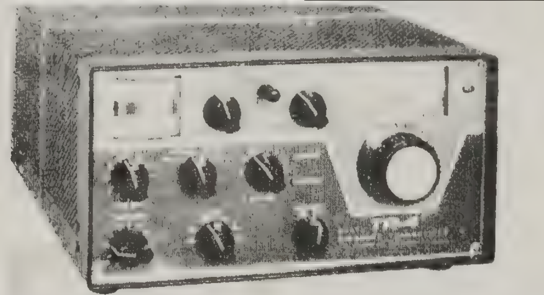
MN-4



TC-2

AC-4	AC Power Supply for T-4B or T-4XB (can be housed in MS-4 cabinet)
MS-4	Matching Speaker for use with R-4B Receiver (has space to house AC-3 or AC-4)
Crystals	For T-4XB xmtr or R-4B rcvr. each
RF Directional Wattmeters	Read forward and reflected power directly **W-4** 1.8-54 MHz 200 and 2000 watt full scale **WV-4** 20-200 MHz 100 and 1000 watts full scale **CB** Citizens Band 10 watts continuous duty
MN-4	Matching network with integral VSWR meter and RF wattmeter. Covers Ham bands 80 thru 10 meters. 200 watts max.
MN-2000	Same as MN-4 except 2000 watts P.E.P. max.
SC-2	Fet Converter for 2 meters
SC-6	Fet Converter for 6 meters
CPS-1	Power Supply for SC-2 & SC-6
SCC-1	VHF Xtal Calibrator
TC-2	Transmitting Converter for 2 meters
TC-6	Transmitting Converter for 6 meters
9-NB	**Noise blanker for TR-6**
34-NB	**Noise blanker for TR-4 (factory installed)**
729-SRD	**Cardioid Microphone—VOX or push-to-talk**



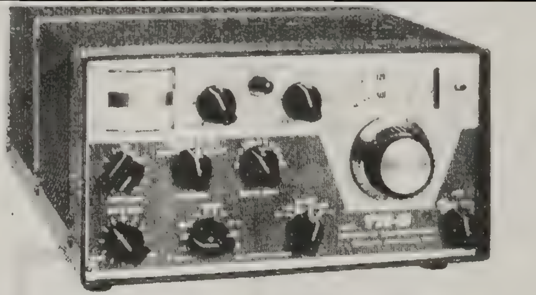


TR-4
SIDEBAND TRANSCEIVER
with noise blanker

GENERAL: • **All amateur bands** 10 thru 80 meters in seven 600 kc ranges • **Solid State VFO** with 1 kc dial divisions • **Modes** SSB Upper and Lower, CW and AM • **Built-in Sidetone** and automatic T/R switching on CW • **30 tubes and semi-conductors** • **Dimensions:** 5½"H, 10¾" W, 14⅜"D. **Wt.:** 16 lbs

TRANSMIT: • **VOX or PTT** on SSB or AM • **Input Power:** SSB. 300 watts P.E.P.; AM, 260 watts P.E.P. controlled carrier compatible with SSB linears; CW, 260 watts • **Adjustable pi-network.**

RECEIVE: • **Sensitivity** better than ½ uV for 10 db S/N • **I.F. Selectivity** 2.1 KHz @ 6 dB, 3.6 KHz @ 60 dB. • **AGC** full on receive modes, variable with RF gain control, fast attack and slow release with noise pulse suppression • **Diode Detector** for AM reception.



TR-6
SIDEBAND TRANSCEIVER
for 6 Meters
with noise blanker

GENERAL: • **Full coverage of 6 meter band** plus MARS 49.4 to 54.0 MHz (49.9 to 51.0 MHz with crystals supplied) • **Solid State VFO** with 1 kHz dial divisions • USB-AM-CW (LSB Filter is available) • **Built-in sidetone** and automatic T/R switching on CW • **19 tubes, 10 transistors, 12 diodes** • **Dimensions:** 5⁷⁄₁₆"H, 10¾"W, 14¼"D **Wt.:** 15¾ lbs

TRANSMIT: • **VOX or PTT** on SSB and AM • **Input Power:** 300 watts PEP on SSB and AM, 300 watts CW • **Adjustable pi-network** • **Plate/relative output and AGC metering**

RECEIVE: • **FET front end,** less than 1/10 uV for 10 dB S/N • **Selectivity** 2.1 kHz at 6 dB, front panel switching for accessory filters (CW, AM, LSB) • **Diode and product detectors switchable** from front panel • **Fast attack,** fast/slow release AVC system (switchable) • **S-Meter**

Accessories for TR-4 and TR-6

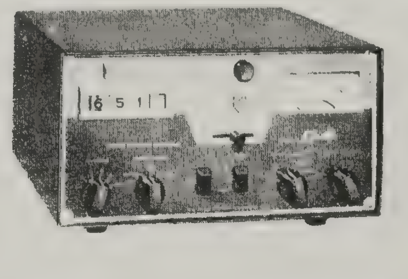
RV-4 and RV-6
Permit reception, transmission, or transceiver operation on separate frequency in same band to which the transceiver is tuned, without retuning VFO.

MMK-3 Mobile Mounting Kit

MS-4 Matching Speaker
Power Supplies **AC-4, DC-4, DC-24**

FF-1 Fixed Frequency Adapter
Crystal Control Unit plugs into and sits under TR-4. Gives two channels in ham bands.

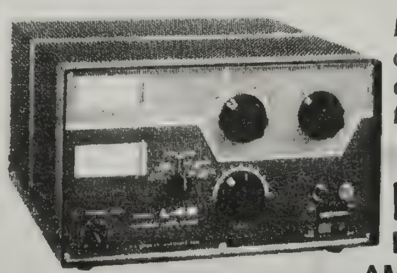
MC-4 Mobile Console



C-4
STATION CONSOLE

Puts complete station control at operator's fingertips.

• **24 hour digital clock**—lighted, shows correct time to the second • **Solid state resettable timer** flashes light at identification intervals • **Station power control** with eight 120 VAC and two 240 VAC receptacles, front panel controlled heavy duty power contractor • **Equipment control switch** for changing exciters, rcvrs., etc. • **Directional RF wattmeter** with 200 or 2000 W full scale • **Built-in rotor control** for Ham-M • **Electronic phone patch** gives const. xmtr input, works PTT, meets phone co. requirements • **Remote motor-driven coax switch** selects from 5 antennas • **Dimens:** 10¾" W x 5½" H x 12¼" D., **Wt.** 24 lbs.



including Power Supply

Built for continuous duty at full capacity

L-4B
LINEAR AMPLIFIER

•**2000 Watts PEP-SSB**; 1000 Watts AM, CW, RTTY • **Class B Grounded-Grid** — two 3-500Z Tubes • **Broad Band Tuned-Input** for low distortion, high efficiency • **RF Negative Feedback** gives lower distortion• **Transmitting AGC** for higher audio level without clipping • **Directional Wattmeter** measures forward and reflected power • **Two Taut-band Suspension Meters** • Plate Current Meter time constant is consistent with FCC Regulations • **Solid state Power Supply** is separate • **Quiet,** low-velocity, high-volume Blower • The simple uncomplicated circuitry, the rugged tubes and the massive construction assures long, trouble-free life • **L-4B** 13¹⁵⁄₁₆"W, 7⅞"H, 14⁹⁄₁₆"D. **Wt.:** 32 lbs. • **Power Supply:** 6¾"W, 7⅞"H, 11"D; **Wt.:** 43 lbs

The buy of a lifetime . . . to last a lifetime

Ask about the Drake **SW-4A**, International Short-Wave Broadcast **Receiver** for SWL fans.

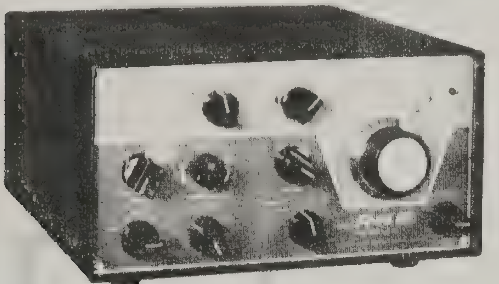
Prices and specifications subject to change without notice.

Also—Drake complete line of Television Interference Filters—HP, LP, CB & FMS models.

Drake products are available at your distributor
. . . for a free brochure on any unit, write . . .

R. L. DRAKE COMPANY • 540 Richard St., Miamisburg, Ohio 45342

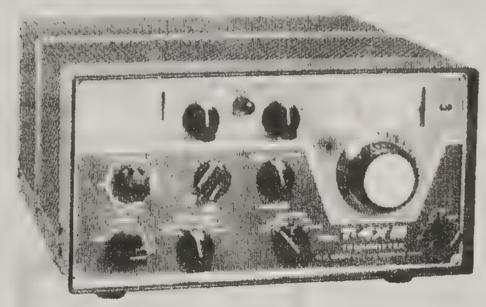
DRAKE 4-LINE *Superior performance—versatility!*



R-4B
RECEIVER

Versatility . . .
Accuracy . . .
Dependability . . .

• **Linear permeability tuned VFO** with 1 kc dial divisions VFO and crystal frequencies pre-mixed for all-band stability • **Covers ham bands** 80, 40, 20, 15 meters completely and 28.5 to 29.0 Mc of 10 meters with crystals furnished • **Any ten 500 kc ranges between 1.5 and 30 Mc** can be covered with accessory crystals for 160 meters, MARS, etc. (5.0-6.0 Mc not recommended) • **Four bandwidths of selectivity**, 0.4 kc, 1 2 kc, 2.4 kc and 4.8 kc • **Passband tuning** gives sideband selection, without retuning • **Noise blanker that works on CW, SSB, and AM** is built-in • **Notch filter and 25 Kc crystal calibrator** are built-in • **Product detector** for SSB/CW, **diode detector** for AM • **Crystal Lattice Filter** gives superior cross modulation and overload characteristics • **Solid State Permeability Tuned VFO** • 10 tubes, 10 transistors, 17 diodes and 2 integrated circuits • **AVC** for SSB or high-speed break-in CW • **Excellent Overload and Cross Modulation characteristics** • **Dimensions:** 5½"H, 10¾"W, 12¼"D. **Wt.:** 16 lbs.



T-4XB
TRANSMITTER

Use VFO of either R-4B or T-4XB for transceiving or separately.

• **Covers ham bands** 80, 40, 20, 15 meters completely and 28.5 to 29.0 Mc of 10 meters with crystals furnished; 160 M and other frequencies with accessory crystals, except 2.3-3, 5-6, 10.5-12 Mc. • **Upper and Lower Sideband** on all frequencies • **Automatic Transmit Receive Switching on CW** (semi break-in) • **Controlled Carrier Modulation for AM** is completely compatible with SSB linear amplifiers • **VOX or PTT** on SSB and AM built-in • **Adjustable Pi-Network Output** • **Two 8-pole Crystal-Lattice Filters** for sideband selection, 2.4 kc bandwidth • **Transmitting AGC** prevents flat topping • **Shaped Grid Block Keying** with side tone output • **200 Watts PEP Input on SSB**— 200 watts input CW • **Meter indicates plate current and relative output** • **Compact size; rugged construction** • **Solid State Permeability Tuned VFO** with 1 kc divisions • **Solid State HF Crystal Oscillator** • **11 Tubes, 3 Transistors and 12 diodes** • **Dimensions:** 5½"H, 10¾"W, 12¼"D. **Wt.:** 14 lbs.

SPR-4

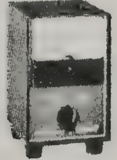
Solid
State

PROGRAMABLE
RECEIVER

The SPR-4 outperforms the best tube receiver, and has all advantages of solid state design . . . low power consumption, high stability and reliability. It is a general purpose rcvr, programable for any interest . . . SWL, Ham, lab, BC, marine, etc. • **Only FETs** in signal path • **Linear VFO** with 1 kHz readout • **Covers 150-500 kHz plus any 23 ranges (500 kHz wide) .500-30 MHz** • **10 ranges furnished**, others $5.00 each • **Coverage easily changed** • **3 band-widths:** 0.4, 2.4 and 4.8 kHz for CW, SSB and AM • **Built-in spkr** • **Notch filter** • **115 or 220 VAC, or 12 VDC** • **Dimens:** 10¾" W x 5½" H x 12¼" D, **Wt.** 14 lbs.

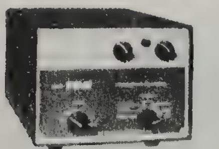
ACCESSORIES: Noise Blanker, 100 kHz Calibrator, MS-4 Speaker, AL-4 Loop Antenna for .15-1.5 MHz, Transceive Adaptor (T-4XB), DC Power Cord, Crystals.

4-Line Accessories



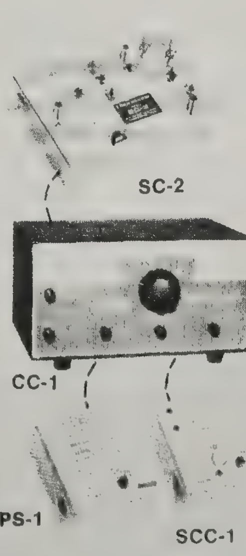
W-4

MN-4

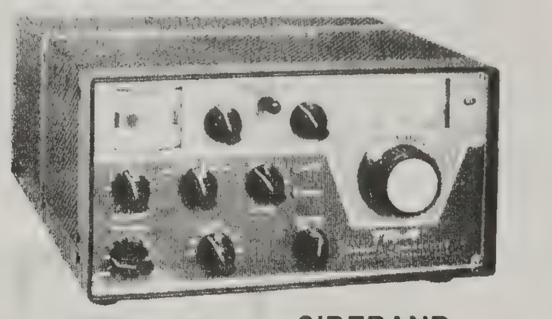


TC-2

AC-4	AC Power Supply for T-4B or T-4XB (can be housed in MS-4 cabinet)
MS-4	Matching Speaker for use with R-4B Receiver (has space to house AC-3 or AC-4)
Crystals	For T-4XB xmtr or R-4B rcvr. each
RF Directional Wattmeters	Read forward and reflected power directly **W-4** 1.8-54 MHz 200 and 2000 watt full scale **WV-4** 20-200 MHz 1.00 and 1000 watts full scale **CB** Citizens Band 10 watts continuous duty
MN-4	Matching network with integral VSWR meter and RF wattmeter. Covers Ham bands 80 thru 10 meters. 200 watts max.
MN-2000	Same as MN-4 except 2000 watts P.E.P. max.
SC-2	Fet Converter for 2 meters
SC-6	Fet Converter for 6 meters
CPS-1	Power Supply for SC-2 & SC-6
SCC-1	VHF Xtal Calibrator
TC-2	Transmitting Converter for 2 meters
TC-6	Transmitting Converter for 6 meters
9-NB	**Noise blanker for TR-6**
34-NB	**Noise blanker for TR-4 (factory installed)**
729-SRD	**Cardioid Microphone—VOX or push-to-talk**



Drake products are available at your distributor
. . . for a free brochure on any unit, write . . .



TR-4
SIDEBAND TRANSCEIVER
with noise blanker

GENERAL: • **All amateur bands** 10 thru 80 meters in seven 600 kc ranges • **Solid State VFO** with 1 kc dial divisions • **Modes** SSB Upper and Lower, CW and AM • **Built-in Sidetone** and automatic T/R switching on CW • **30 tubes and semi-conductors** • **Dimensions:** 5½"H, 10¾" W, 14⅜"D. **Wt.:** 16 lbs.

TRANSMIT: • **VOX or PTT** on SSB or AM • **Input Power:** SSB, 300 watts P.E.P.; AM, 260 watts P.E.P. controlled carrier compatible with SSB linears; CW, 260 watts • **Adjustable pi-network.**

RECEIVE: • **Sensitivity** better than ½ uV for 10 db S/N • **I.F. Selectivity** 2.1 KHz @ 6 dB, 3.6 KHz @ 60 dB. • **AGC** full on receive modes, variable with RF gain control, fast attack and slow release with noise pulse suppression • **Diode Detector** for AM reception.

TR-6
SIDEBAND TRANSCEIVER
for 6 Meters
with noise blanker

GENERAL: • **Full coverage of 6 meter band** plus MARS 49.4 to 54.0 MHz (49.9 to 51.0 MHz with crystals supplied) • **Solid State VFO** with 1 kHz dial divisions • USB-AM-CW (LSB Filter is available) • **Built-in sidetone** and automatic T/R switching on CW • **19 tubes, 10 transistors, 12 diodes** • **Dimensions:** 5⁷⁄₁₆"H, 10¾"W, 14¼"D. **Wt.:** 15¾ lbs.

TRANSMIT: • **VOX or PTT** on SSB and AM • **Input Power:** 300 watts PEP on SSB and AM, 300 watts CW • **Adjustable pi-network** • **Plate/relative output and AGC metering**

RECEIVE: • **FET front end**, less than 1/10 uV for 10 dB S/N • **Selectivity** 2.1 kHz at 6 dB, front panel switching for accessory filters (CW, AM, LSB) • **Diode and product detectors switchable** from front panel • **Fast attack**, fast/slow release AVC system (switchable) • **S-Meter**

Accessories for TR-4 and TR-6

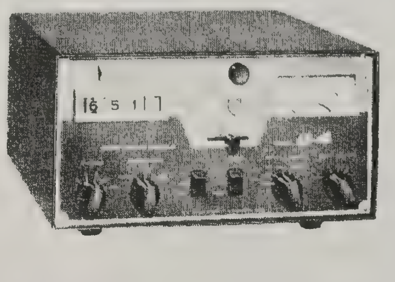
RV-4 and RV-6
Permit reception, transmission, or transceiver operation on separate frequency in same band to which the transceiver is tuned, without retuning VFO.

MMK-3 Mobile Mounting Kit

MS-4 Matching Speaker
Power Supplies **AC-4, DC-4, DC-24**

FF-1 Fixed Frequency Adapter
Crystal Control Unit plugs into and sits under TR-4. Gives two channels in ham bands.

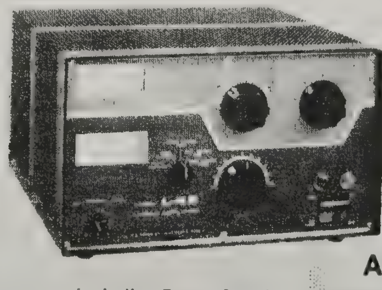
MC-4 Mobile Console



C-4
STATION CONSOLE

Puts complete station control at operator's fingertips.

• **24 hour digital clock**—lighted, shows correct time to the second • **Solid state resettable timer** flashes light at identification intervals • **Station power control** with eight 120 VAC and two 240 VAC receptacles, front panel controlled heavy duty power contractor • **Equipment control switch** for changing exciters, rcvrs., etc. • **Directional RF wattmeter** with 200 or 2000 W full scale • **Built-in rotor control** for Ham-M • **Electronic phone patch** gives const. xmtr input, works PTT, meets phone co. requirements • **Remote motor-driven coax switch** selects from 5 antennas • **Dimens:** 10¾" W x 5½" H x 12¼" D., **Wt.** 24 lbs.



Including Power Supply

Built for continuous duty at full capacity

L-4B
LINEAR AMPLIFIER

•**2000 Watts PEP-SSB**; 1000 Watts AM, CW, RTTY • **Class B Grounded-Grid** — two 3-500Z Tubes • **Broad Band Tuned-Input** for low distortion, high efficiency • **RF Negative Feedback** gives lower distortion • **Transmitting AGC** for higher audio level without clipping • **Directional Wattmeter** measures forward and reflected power • **Two Tautband Suspension Meters** • Plate Current Meter time constant is consistent with FCC Regulations • **Solid state Power Supply** is separate • **Quiet**, low-velocity, high-volume Blower • The simple uncomplicated circuitry, the rugged tubes and the massive construction assures long, trouble-free life • **L-4B** 13¹⁵⁄₁₆"W, 7⅞"H, 14⁵⁄₁₆"D. **Wt.:** 32 lbs. • **Power Supply:** 6¾"W, 7⅞"H, 11"D; **Wt.:** 43 lbs

The buy of a lifetime . . . to last a lifetime

Ask about the Drake **SW-4A**, International Short-Wave Broadcast **Receiver** for SWL fans.

Prices and specifications subject to change without notice.

Also—Drake complete line of
Television Interference Filters—
HP, LP, CB & FMS models

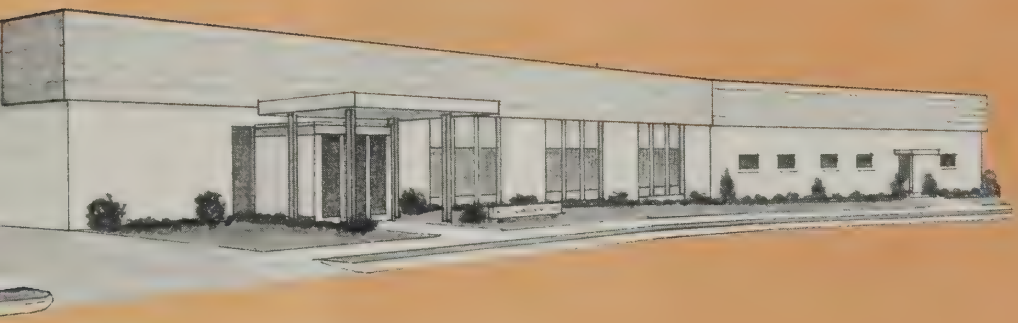
R. L. DRAKE COMPANY • 540 Richard St Miamisburg, Ohio 45342

DRAKE

Equipment for Radio Communications

Known throughout the world for quality...

DRAKE® Equipment for Radio Communications



R. L. DRAKE COMPANY
540 Richard Street, Miamisburg, Ohio 45342
Phone (513) 866-2421 • Telex 288-017

Specifications, availability and prices subject to change without notice or obligation

Drake TVI Filters

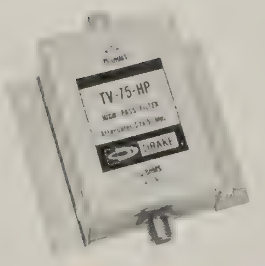
High Pass Filters for TV Sets

provide more than 40 dB attenuation at 52 MHz and lower. Protect the TV set from amateur transmitters 6-160 meters.

Model No. 1603

Drake TV-300-HP

For 300 ohm twin lead. New terminals for easy installation.



Model No. 1610

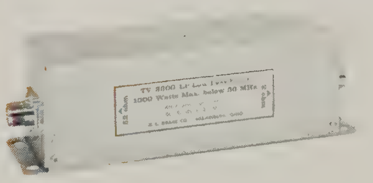
Drake TV-75-HP

For 75 ohm TV coaxial cable; TV type "F" connectors installed.

Low Pass Filters for Transmitters

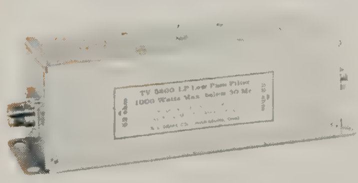
have four pi sections for sharp cut off above the hf amateur bands and to attenuate transmitter harmonics falling in any TV channel and fm band. 52 ohm. SO-239 connectors built in.

Model No. 1608 Drake TV-3300-LP



1000 watts max. below 30 MHz. Attenuation better than 80 dB above 41 MHz. Helps TV i-f interference, as well as harmonic interference.

Model No. 1609 Drake TV-5200-LP



200 watts to 52 MHz. Ideal for six meters. For operation below six meters, use TV-3300-LP or TV-42-LP.

Model No. 1605 Drake TV-42-LP

is a four section filter designed with 43.2 MHz cut-off and extremely high attenuation in all TV channels for transmitters operating at 30 MHz and lower. Rated 100 watts input.

Drake TVI Filters help you keep peace with your neighbors

Drake WH-7 Directional RF Wattmeter

1.8-30 MHz

Model
1514

Drake directional, through line wattmeters, using printed circuits, toroids, and state of the art techniques, permit versatile performance and laboratory accuracy, yet at a lower cost.

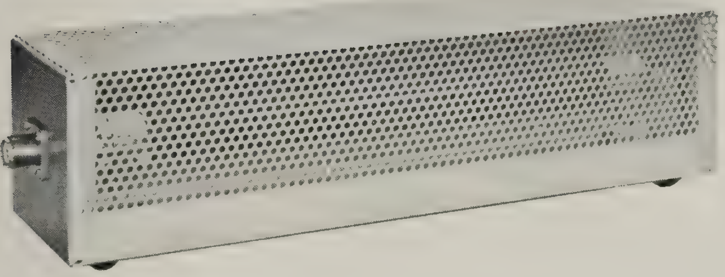
Removable coupler provides remote metering, and allows convenient positioning of coaxial cable.

WH-7 wattmeter makes possible quick, accurate adjustments of antenna resonance and impedance match, when placed between transmitter and matching network.

Drake WH-7: Designed for user convenience and high accuracy. This instrument includes three calibrated scales for rf power to satisfy applications from QRP to high power (0-20, 0-200 and 0-2000 watts full scale) A fourth calibrated scale provides direct reading VSWR information, and is switch selected from front panel. The WH-7 is styled to match the 7-line.

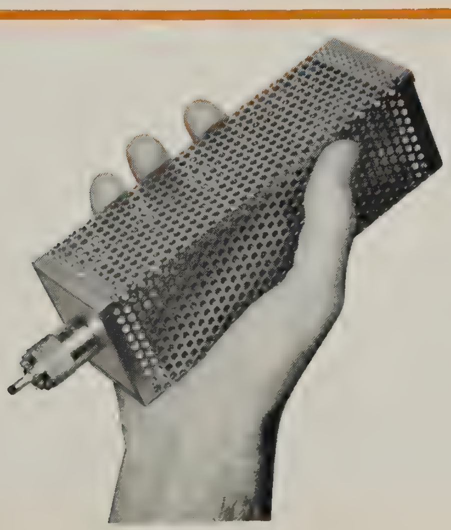
Specifications	
Frequency Coverage	1.8-30 MHz
Line Impedance	50 ohm resistive
Power Capability	2000 W continuous
Jacks, Removable Coupler	Two S0239 input and output connectors
Semiconductors	Two power meter rectifiers
Accuracy	± (5% of reading + 1% of full scale)
VSWR Insertion	Insertion of wattmeter in line changes VSWR no more than 1.05:1
Shipping Weight	3 lbs (1.4 kg)
Dimensions	5.3″H x 6.9″W x 7.5″D (13.5 x 17.5 x 19 cm)

Drake "Dry" Dummy Loads—no oil required



Model 1551 Drake DL-1000

- **1000 watts** for 30 seconds, with derating curve to 5 minutes. Designed to accept Drake FA-7 cooling fan for extended high power operation.
- **VSWR of 1.5:1 max.** 0-30 MHz.
- Provided with SO-239 coax connector, and rubber feet for desk or bench use.
- **Size** 14″ x 3.6″ (35.6 x 9.1 cm). Wt. 2 lbs (910 g)



Model 1550 Drake DL-300

- **300 watts** for 30 seconds, with derating curve to 5 minutes.
- **Built-in PL-259** coax connector for direct connection to rear of transceiver or transmitter-no jumper coax necessary.
- **VSWR of 1.1:1 max.** 0-30 MHz 1.5 max. 30-160 MHz.
- Ideal as bench test device for amateur or commercial hf and vhf gear.
- **Small size** fits conveniently in any field service tool box. 6.7″ x 2.08″ (17.0 x 5.3 cm). Wt. 11 oz (310 g)

A remarkable engineering breakthrough...

DRAKE TR-7

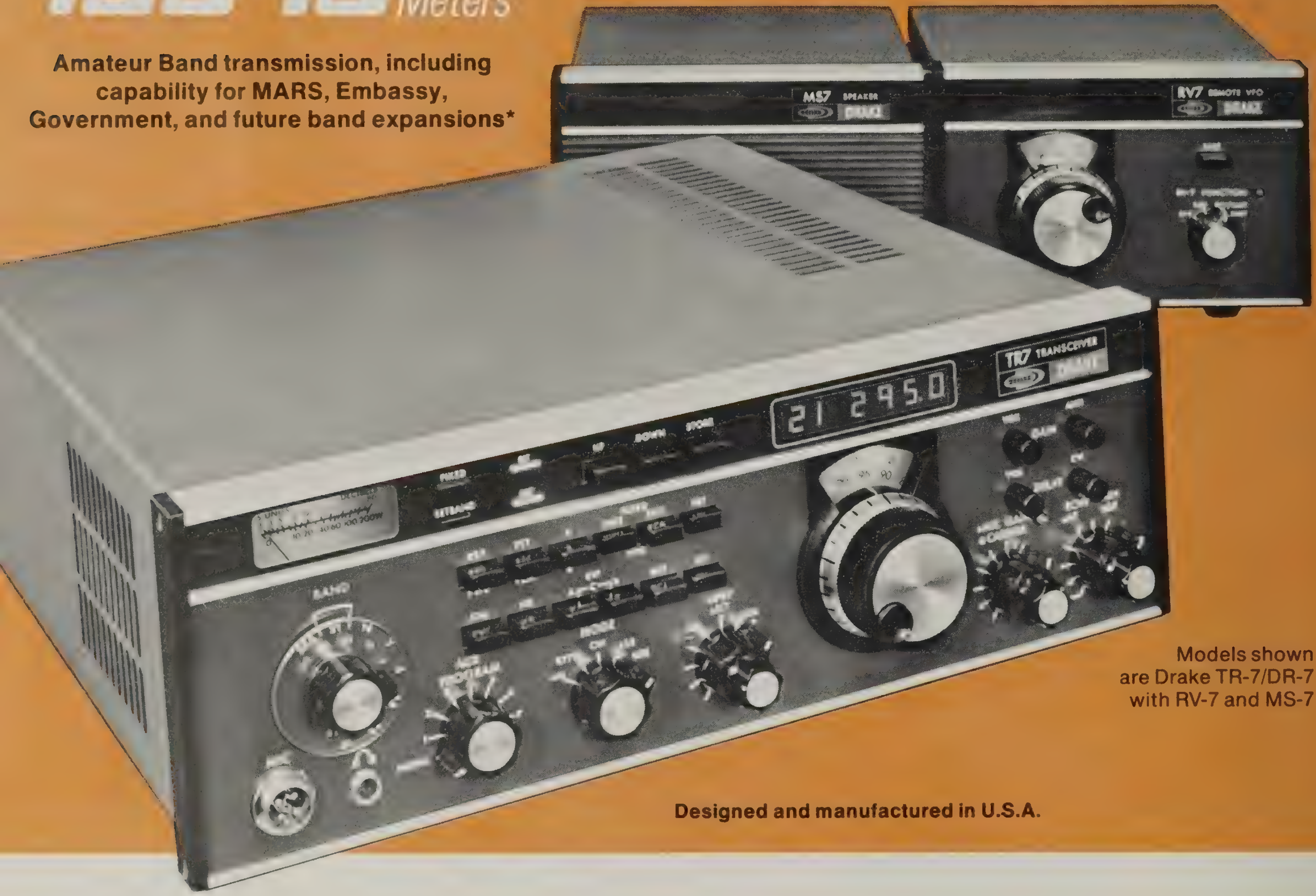
0-30 MHz

continuous coverage reception—no gaps—no range crystals required

160-10 Meters

Amateur Band transmission, including capability for MARS, Embassy, Government, and future band expansions*

The Drake TR-7 System significantly advances the technology of worldwide radio communications and unfolds an entirely new state of the art.



Models shown are Drake TR-7/DR-7 with RV-7 and MS-7

Designed and manufactured in U.S.A.

In 1963 Drake led the way by producing the first commercially available amateur transceiver that employed the now widely copied 9 MHz i-f frequency. Even today, many major competitive transceivers are still being introduced using i-f's in this range.

Now, Drake leads the way again by developing the first commercially available amateur transceiver that uses a 48 MHz i-f, through the technique of "Up-Conversion." This system greatly improves image and general coverage performance, and will be copied in the years to come. With Drake, you can join the new state of the art today!

solid state continuous coverage synthesized hf system

Model 1337

The design philosophy behind the new Drake "7 system" has created a most sophisticated system concept, extending from engineering to the visual appearance of the system and each of its parts.

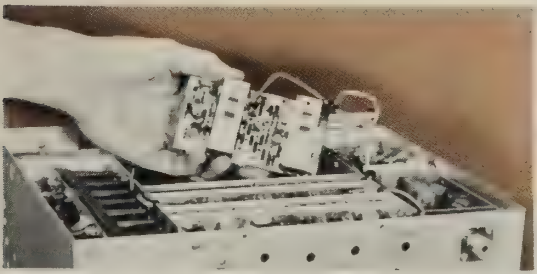
The TR-7 System is the result of one of the most extensive engineering and development programs in the history of the R. L. Drake Company, and provides the user with many innovative design features.

With the excellent design of its front panel and controls, the system is simple and straightforward to operate–makes state of the art performance a pleasure.

Broadband, Solid State Design—100% solid state throughout. All circuits are broadbanded so there is no need for preselection tuning or transmitter adjustments of any kind.

Synthesized/PTO Frequency Control—A Drake exclusive: Special high performance synthesizer, combined with the famous Drake PTO, provides smooth, linear tuning with 1 kHz dial and 100 Hz digital readout. 500 kHz up/down range switching is pushbutton controlled.

Continuous, Wide Range Frequency Coverage—The TR-7/DR-7 provides reception from 1.5 thru 30 MHz—continuously, and **zero** thru **30 MHz** continuously with the optional Aux-7 Range Program Board. No gaps or range crystals required. The highly advanced Drake Synthesizer makes this possible, and is an industry first. The TR-7/DR-7 provides transmit coverage for all Amateur Bands 160 thru 10 meters. With the optional Aux-7 Range Program Board, diode-programmable out-of-band transmit coverage is available for MARS, Embassy, Government, and future band expansions in the range 1.8 thru 30 MHz.* The Aux-7 Board also provides 0 thru 1.5 MHz receive coverage and crystal-controlled fixed channel operation for Government, Amateur, or semi-commercial applications anywhere in the hf range. The TR-7 w/o DR-7 provides coverage of the Amateur Bands 160 thru 15 meters and the 28.5-29.0 MHz range of 10 meters. The Aux-7 Range Program Board is also useable in the standard TR-7 for extra range coverage as noted.

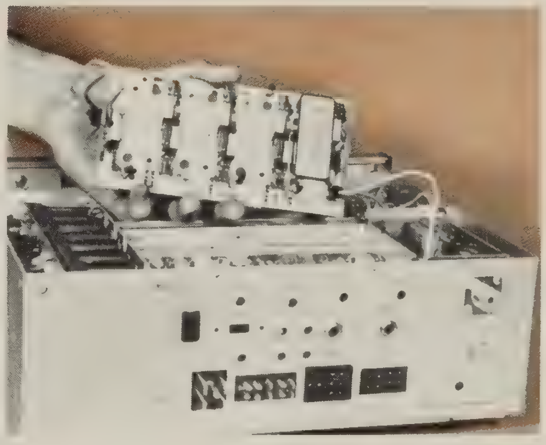


State of the Art Receiver Design—The Drake TR-7 introduces another industry first for amateur transceivers: "Up-Conversion," in combination with a special high level double balanced mixer for superior strong signal handling, spurious and image response performance. The first i-f of 48.05 MHz places images well outside the receiver passband, and provides for true general coverage operation without i-f gaps.

True Passband Tuning—The TR-7 employs the famous Drake Full Passband Tuning instead of the limited range "i-f shift" found in some other units. The Drake System tunes from the top edge of one sideband, through center, to the bottom edge of the other sideband. In fact, the range is even wider to accommodate RTTY. Full passband tuning greatly improves receiving performance in heavy QRM.

Unique Independent Receive Selectivity—Optional receiving selectivity filters can be installed internally and pushbutton-selected from the front panel. These may be selected independently of transmit mode and provide optimum response for various conditions of ssb, cw, RTTY, and a-m. You may also transmit cw while receiving ssb, or vice versa, or even transmit one sideband while receiving the other. The standard filter is 2.3 kHz for ssb. You may choose from optional 300 Hz, 500 Hz, a special 1.8 kHz for crowded ssb, or 6 kHz filter for a-m. Any three may be installed in addition to the ssb filter.

Effective Noise Blanker—This accessory is custom engineered to provide true impulse-type noise blanking performance.



Special High Power Solid State PA—A Drake custom-designed diagonal heat sink provides for an internally mounted power amplifier with nothing mounted outboard subject to physical damage. The unique air ducting effect of this amplifier allows an optional rear-mounted fan to provide continuous duty on SSTV/RTTY. Continuous ssb/cw

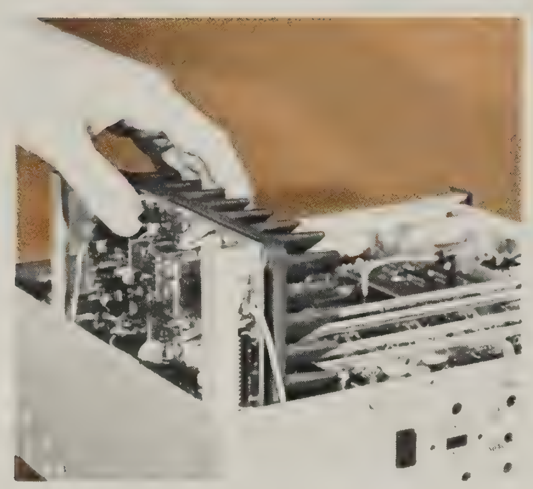
(TR-7 features continued on next page)

---

*Note: Out-of-band transmitter coverage for MARS, Government, etc. is available only in ranges authorized by the FCC, Military, or other government agency for a specific service. Proof of license for that service must be submitted to the R. L. Drake Company, including the 500 kHz range to be covered. Upon approval, and at the discretion of the R. L. Drake Company, a special range IC will be supplied for use with the Aux-7 Range Program Board. Prices quoted from the factory. See operator's manual for details. (Not available for services requiring type acceptance.)

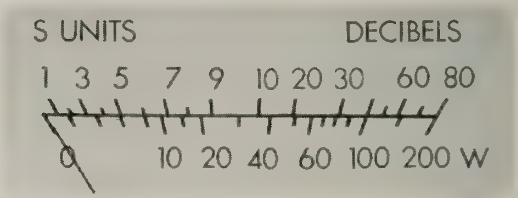
(Continued from preceding page)

DRAKE TR-7 solid state continuous coverage synthesized hf system

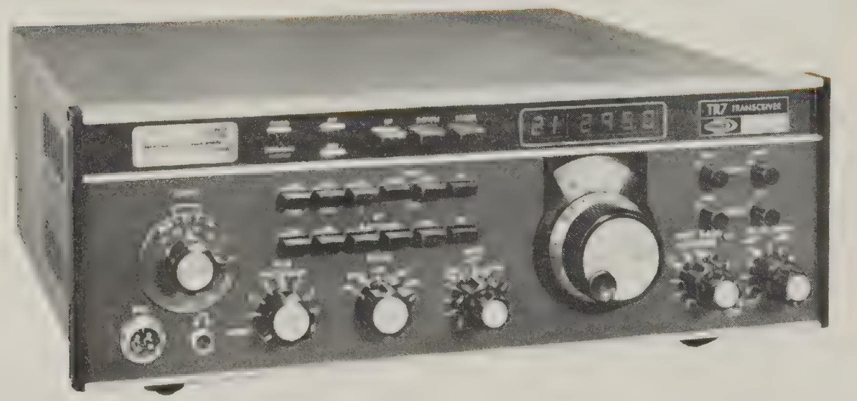


operation is available without the fan, due to the excellent heat sink design. The optional Drake PS-7 Ac Supply is rugged, rated for continuous duty, and will easily handle power requirements. The System is rated 250 watts input—in any of its modes. Fully VSWR protected.

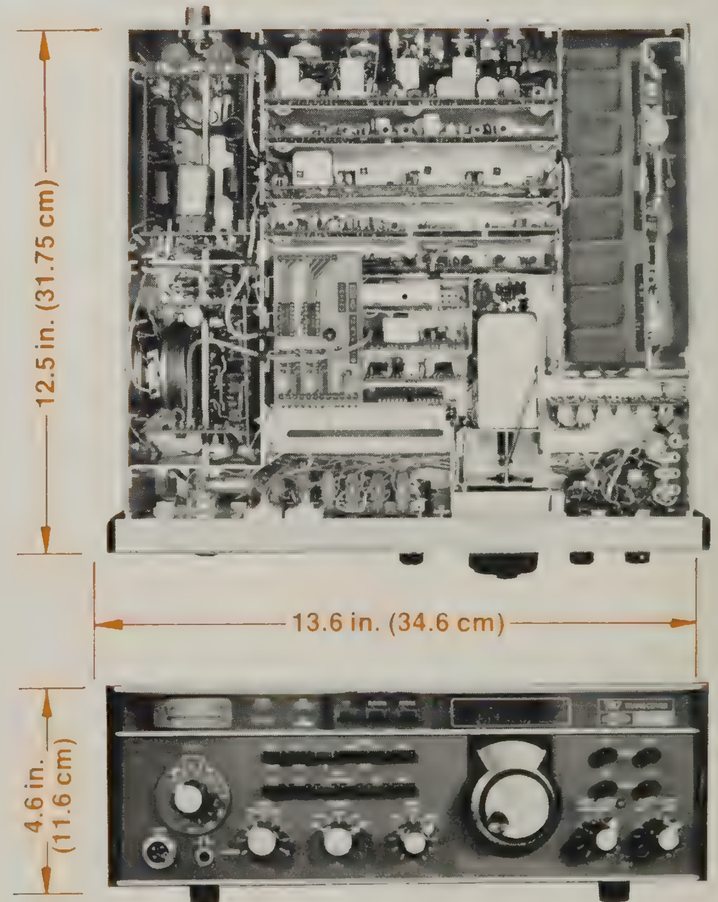
TR-7 Internal Test Facilities—As well as the standard "S" meter function, the TR-7 metering includes a built-in rf Wattmeter/VSWR Bridge. Also, the DR-7 digital counter reads frequencies to 150 MHz for test purposes. Access to the counter is from the rear panel.



Receiver Incremental Tuning (RIT)—Complete RIT Flexibility is provided for both the TR-7 and RV-7 remote VFO for maximum convenience. The RV-7 also includes a special "spot" function for easy zero beating.



Model 1337	Drake TR-7 Transceiver
Model 1530	Drake DR-7 General Coverage/ Digital Readout Board
Model 1336	Drake TR-7/DR-7 General Coverage Digital R/O Transceiver
Model 1338	Drake RV-7 Remote VFO
Model 1502	Drake PS-7 120/240V Ac Supply includes special wide range voltage and frequency capability. Operates from any nominal line voltage (90-132 V 180-264 V; 50-60 Hz) ideal for overseas
Model 1536	Drake Aux-7 Range Program Board†
Model 1531	Drake MS-7 Matching Speaker
Model 1537	Drake NB-7 Noise Blanker
Model 1529	Drake FA-7 Fan
Model 7021	Drake SL-300 Cw Filter, 300 Hz
Model 7022	Drake SL-500 Cw Filter, 500 Hz
Model 7023	Drake SL-1800 Ssb/RTTY Filter, 1.8 kHz
Model 7024	Drake SL-6000 A-m Filter, 6.0 kHz
Model 1335	Drake MMK-7 Mobile Mounting Kit
Model 7037	Drake TR-7 Service Kit/Extender Board Set
Model 385-0004	Drake TR-7 Service/Schematic Book



DRAKE TR-7 SPECIFICATIONS

GENERAL

Frequency Coverage *(with DR-7 Digital R/O Gen. Cov. Board)*	
Receive	
Without Aux-7	1.5 to 30 MHz, continuous, no gaps
With Aux-7†	Same, plus 0 to 1.5 MHz at reduced performance in this range
Transmit	
Without Aux-7	1.8-2.0, 3.5-4.0, 7.0-7.5, 14.0-14.5, 21.0-21.5, 28.0-30.0 MHz
With Aux-7†	Above ranges, plus any eight 500 kHz segments from 1.8 to 30 MHz
Frequency Coverage *(without DR-7 Digital R/O Gen. Cov. Board)*	
Receive/Transmit (Transmit above 1.8 MHz only)	
Without Aux-7	1.5-2.0, 3.5-4.0, 7.0-7.5, 14.0-14.5, 21.0-21.5, 28.5-29.0 MHz, plus Receive only on 2.5-3.0 MHz and 5.0-5.5 MHz
With Aux-7†	Above ranges, plus any eight 500 kHz segments from 0 to 30 MHz, (0 to 1.8 MHz Receive only)

Modes of Operation	Usb, Lsb, Cw, RTTY, A-m equiv. (A-3H)
Frequency Stability	Total drift is less than 100 Hz after warm up. Total frequency change is less than 100 Hz over the 11-16 V-dc input supply range
Frequency Readout Accuracy	
Analog	Better than ± 1 kHz when calibrated at the nearest marker point
Digital	15 ppm ± 100 Hz
External Counter Mode	
Maximum Input Frequency	150 MHz
Input Level Range	50 mV to 2 V, rms
Power Supply Requirements	11-16 V-dc (13.6 V-dc nominal), 3A receive. 25A transmit
Dimensions	
Depth	12.5 in. (31.75 cm), excluding knobs and connectors.
Width	13.6 in. (34.6 cm)
Height	4.6 in. (11.6 cm), excluding feet
Weight	17.1 lb. (7.75 kg)

RECEIVER

(1.8-30 MHz, reduced specs 0-1.8 MHz)

Sensitivity	
Ssb, Cw	Less than 0.5 µV for 10 dB (S+N)÷N
A-m (30% Mod.)	Less than 2.0 µV for 10 dB (S+N)÷N
Selectivity	2.3 kHz at −6 dB and 4.1 kHz at −60 dB (1.8:1 shape factor)
Ultimate Selectivity	Greater than 100 dB
Agc	Less than 4 dB output variation for 100 dB input signal change, referenced to agc threshold
Intermodulation	Intercept Point, +20 dBm Two-tone Dynamic Range, 95 dB

I-f Frequency	First I-f ... 48.05 MHz Second I-f ... 5.645 MHz
Image and I-f Rejection	Greater than 80 dB
Spurious Response	Greater than 60 dB down
Internally Generated Spurious	Less than 1 µV equivalent, except 3 µV equivalent from 5 to 6 MHz. (Reduced specs on internal osc frequencies)
Audio Output	2.0 watts @ less than 10% THD (4 ohm load)

TRANSMITTER

Power Input (Nominal)	
Ssb	250 watts PEP
Cw	250 watts
A-m equiv.	80 watts (carrier), plus upper sideband
Load Impedance	50 ohms, nominal
Spurious Output	Greater than 50 dB down
Harmonic Output	Greater than 45 dB down
Intermodulation Distortion	30 dB below PEP (24 dB below one of two tones)
Undesired Sideband Suppression	Greater than 60 dB @ 1 kHz

Duty Cycle	
Ssb, Cw	100%
Tune, SSTV, RTTY, A-m	w/o 1529 FA-7 Fan: 33%, 5 min. transmit, max. with 1529 FA-7 Fan: 100%
Wattmeter Accuracy	±5% @ 100 watts (50 ohm load)
Carrier Suppression	Greater than 50 dB
Microphone Input	High impedance
VSWR Turndown (Nominal) (Percent rf power turndown)	
@ 1:1	0%
@ 2:1	10%
@ 3:1	25%
@ 4:1	50%
@ 5:1 and above	90%

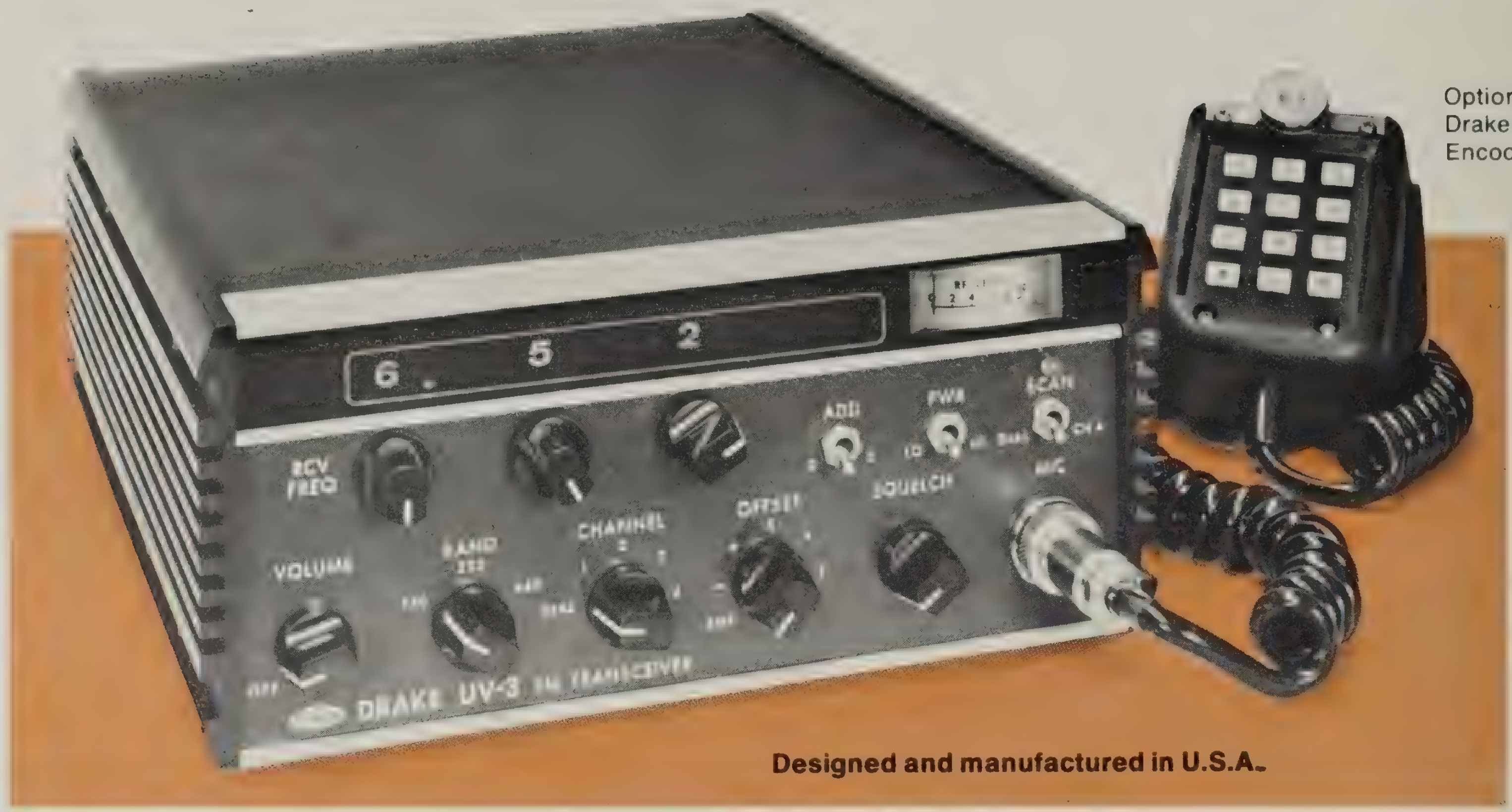
---

† Aux-7 must be used with either Model 1546 RRM-7 Range Receive Module, or Model 1547 RTM-7 Range Transceive Module. Use one module per 500 kHz range. Modules plug directly into Aux-7.

R. L. DRAKE COMPANY DRAKE®

540 Richard St., Miamisburg, Ohio 45342
Phone: (513) 866-2421 • Telex: 288-017

Drake UV-3 uhf-vhf fm



Optional
Drake 1525EM
Encoding Mike

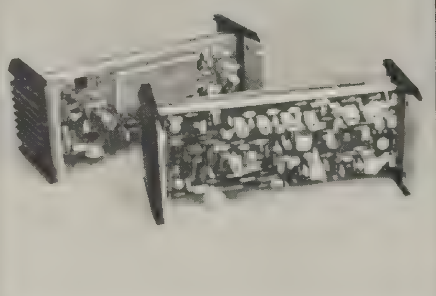
Designed and manufactured in U.S.A.

- Fully synthesized on each band, 5 kHz steps, digital read-out.
- Fm coverage on complete 144, 220 and 440 Amateur Bands, depending on model purchased. Completely band-switched from front panel.
- Four extra diode programmable fixed channels, with offsets, available for each band, in addition to the synthesizer.
- Diode programmable non-standard offsets available for each band.
- Separate SO-239 Antenna Connector for each band.
- Outstanding receiver front-end performance. Ideal for use in metropolitan areas where many repeaters are in use.
- Squelch.
- Hi-lo power, with lo-power adjustable.
- Priority scan feature:
  —scan a programmed fixed channel from any synthesizer frequency.
  —scan any synthesizer frequency from a programmed fixed channel.
  —scan a specific programmed fixed channel from another programmed fixed channel.
- Plug-in modular construction.
- Remote operation. Removable control head will operate radio in trunk compartment from driver seat. (remote kit optional)
- No frequency mixing in transmitter. Transmitter frequency derived directly from VCO frequency. Provides extremely low spurious output.
- Companion ac power supply (PS-3).
- Operate mobile or fixed station. (13.8 V supply required)
- Small, compact, rugged construction utilizing aluminum extrusion sides and panel.
- Transmit audio custom tailored for maximum communications "punch."
- Choice of one, two, or three band coverage in a single transceiver. Basic models may be purchased, with factory installed add-on modules added later.

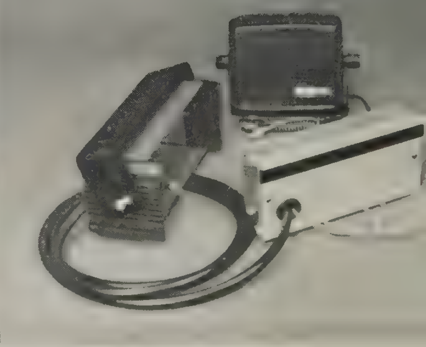
PS-3 Ac Power Supply

1525EM Encoding Microphone

220 and 440 Add-on Modules



UMK-3 Remote Trunk-Mount Kit



3-band system

144 220 440 MHz

Fully synthesized on each band

DRAKE UV-3 SPECIFICATIONS

GENERAL

Frequency Coverage:

144	144-148 MHz*
220	220-225 MHz
440	440-450 MHz

Mode: Fm (5 kHz deviation)

Supply Voltage: 11.5-15.0 V dc negative ground

Supply Current:

Receive	0.9 A Standby
Transmit	6 A High Power 1.3 A Low Power

Dimensions:

Length (single unit)	9″ (22.86 cm)
(two unit)	11.5″ (29.2 cm)
(three unit)	14″ (35.56 cm)
Width	8.1″ (20.6 cm)
Height	3.5″ (8.9 cm)

Weight:

(One unit)	7 lbs. (3.17 kg)
(Two unit)	7.3 lbs. (3.31 kg)
(Three Unit)	7.6 lbs. (3.45 kg)

Operating Temperature: 0°C to 60°C

*Band overlap allows tuning of most Mars frequencies

FREQUENCY SYNTHESIZER

Type: Directly programmable, digital phase locked loop, 5 kHz steps

Reference: 5 MHz crystal oscillator

Frequency Accuracy: ±.0005% over a temperature range of 0°C to 60°C with a supply voltage variation of 11.5 to 15 V dc

RECEIVER

Type: Double conversion, 1st i-f @ 10.7 MHz, 2nd i-f @ 455 kHz, 6 pole crystal filter @ 10.7 MHz and 8 pole ceramic filter at 455 kHz

Selectivity: 12 kHz @ −3 dB

Sensitivity:

146-148 MHz 222-225 MHz 442-447 MHz	Typically less than .35μV for 12 dB SINAD
144-148 MHz 220-225 MHz 440-450 MHz	.5 μV (max.) for 12 dB SINAD

Adjacent Channel Rejection:

144	greater than 80 dB min. @ ± 30 kHz
220, 440	greater than 70 dB min. @ ± 30 kHz
144, 220, 440	greater than 60 dB min. @ ± 15 kHz

Intermodulation Attenuation: (EIA RS-204-A)

144	80 dB (referenced to 12 dB SINAD)
220	75 dB (referenced to 12 dB SINAD)
440	65 dB (referenced to 12 dB SINAD)

Image Rejection:

144	80 dB
220	60 dB
440	50 dB

I-f Rejection: Greater than 95 dB

Audio Output: 2.5 watts @ less than 10% THD, 2 watts @ less than 5% THD

Squelch Sensitivity: Less than 0.2 μV

Meter: Indicates relative signal level

TRANSMITTER

Power Output (13.8 V dc):

High Power:	144	25 watts nom. (144-148 MHz)
	220	10 watts min. (220-225 MHz)
	440	10 watts min. (440-450 MHz)
Low Power:		Approx. 10% of high power (adjustable)

Harmonic and Out of Band Spurious:

144, 220	−60 dB (min.) referenced to carrier
440	−40 DB (min.) referenced to carrier

Spurious in Band: −75 dB (min.) referenced to carrier

Modulation: Direct fm, pre-set to ±5 kHz deviation

Hum and Noise: Greater than 40 dB below maximum deviation

Model 1346 Drake UV-3 (144-220-440)
Model 1344 Drake UV-3 (144-440)
Model 1340 Drake UV-3 (144)

(Models above include factory installed modules for bands as listed, standard dynamic mike, and mobile mounting bracket.)

Add-on modules expand band coverage of models which may have been purchased in a single band or two band configuration. Prices include factory installation which is necessary to meet FCC receiver certification requirements.

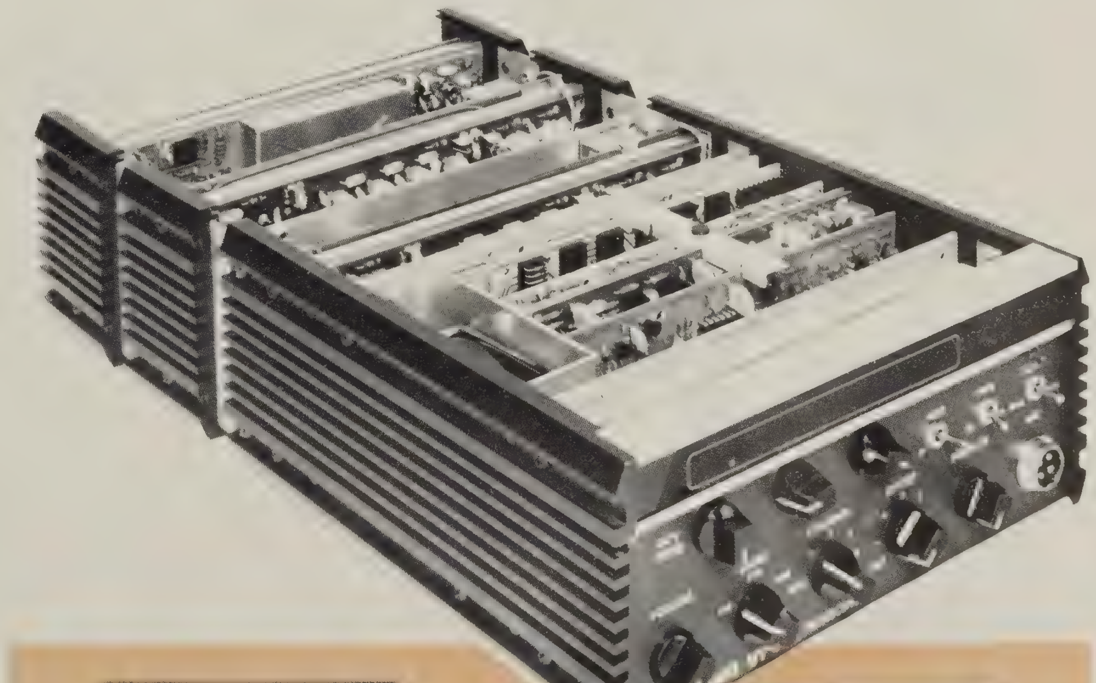
220 Add-on Module
440 Add-on Module
144 Add-on Module

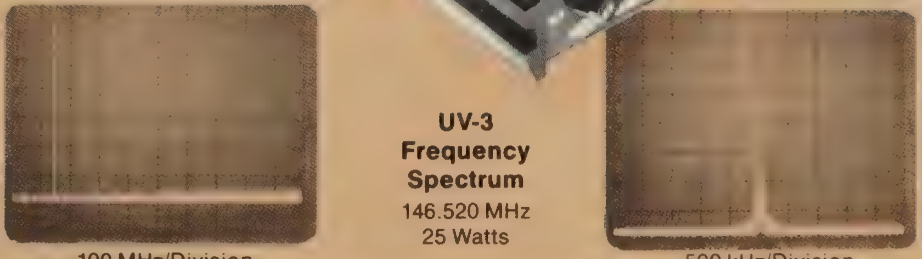
Model 1504 Drake PS-3 AC Power Supply

Model 1525 Drake 1525EM Encoding Mike (see next page)

Model 1330 Drake UMK-3 Remote Trunk-Mount Kit

Model 385-0002 Drake UV-3 Service/Schematic Book





100 MHz/Division

UV-3 Frequency Spectrum
146.520 MHz
25 Watts

500 kHz/Division

DRAKE® MICROPHONES

Drake 1525EM Push Button Encoding Mike

- Microphone and auto-patch encoder in single convenient package with coil cord and connector. Fully wired and ready for use.
- High accuracy IC tone generator, no frequency adjustments.
- High reliability Digitran® keyboard.
- Power for tone encoder obtained from transceiver through microphone cable. No battery required. Low current drain.
- Low output impedance allows use with almost all transceivers.
- Four pin microphone plug: directly connects to Drake UV-3 without any modification in transceiver. Compatible with all previous Drake and other 2 meter units with minor modifications.
- Tone level adjustable

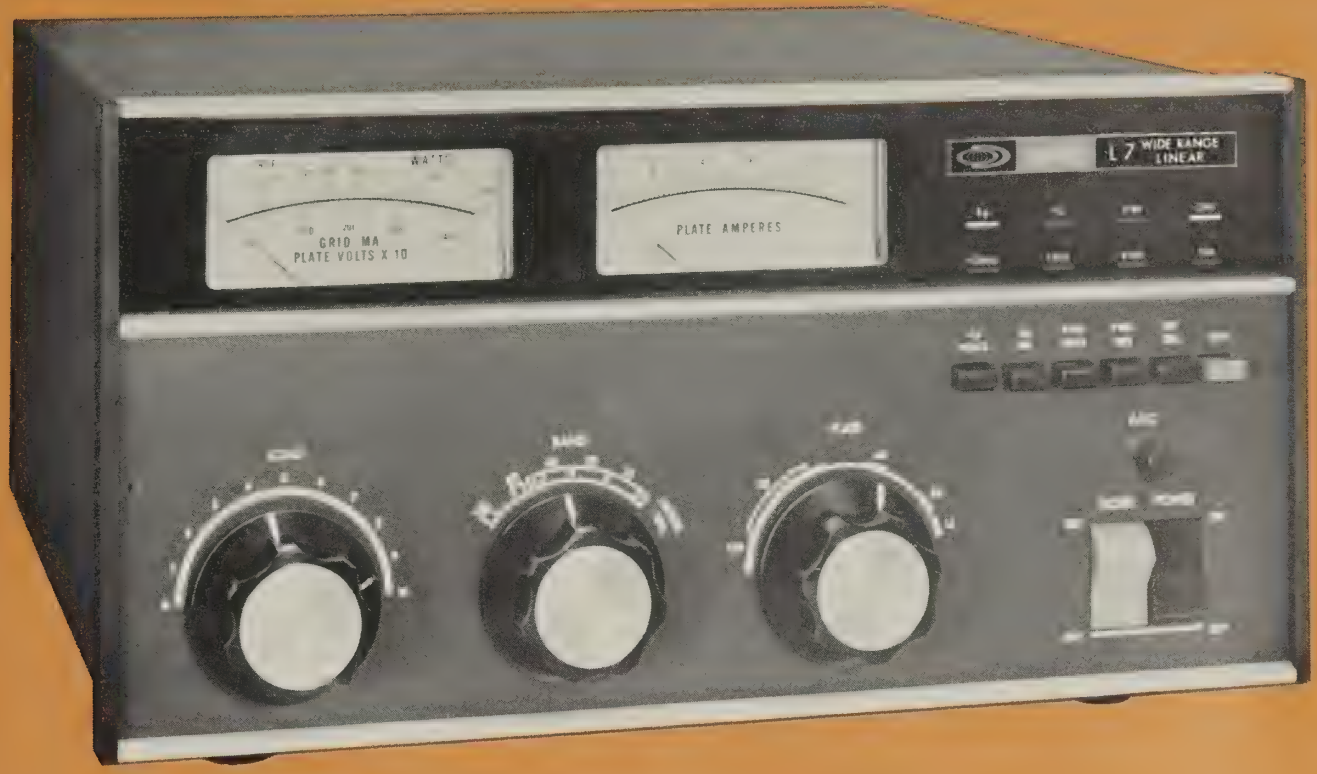
Model 1525

Drake 7077 Dynamic Desk Microphone

- **Audio and level characteristics** custom designed to match the transmit audio requirements of the Drake TR-7.
- **Features both VOX and PTT** operation without modification.
- **High Impedance**
- Includes coil cord and plug wired for direct installation to the Drake TR-7.
- Style and color provide a beautiful match to the Drake 7-Line.
- Size 4.3″W x 5.8″D x 9.3″H (10.9 x 14.7 x 23.6 cm). Wt. 1 lb. 7 oz (650 g).

Drake L-7 Continuous Duty 160-10* Meters 2kW Linear Amplifier

Model 1528



Temperature controlled design for "key-down" operation over a wide frequency range. Newly engineered for coverage of any new or expanded hf amateur bands within FCC amplifier rules. Also features wide frequency coverage for MARS, and other services authorized for this type of amplifier.

2 kW PEP, 1 kW cw, RTTY, SSTV operation—all modes, full rated input, continuous duty cycle.

160-10* meter amateur band coverage, plus expanded ranges for any future hf band expansions or additions within FCC rules. These ranges also include increased coverage for MARS, embassy, government, or other such services.

The Drake L-7 utilizes a pair of Eimac 3-500 Z triodes for rugged use, and lower replacement cost compared to equivalent ceramic types. Tubes are included.

Accurate built-in rf wattmeter, with forward/reverse readings, is switch selected. Calibrated 300/3000 watt scales.

Temperature controlled two speed fan is a high volume low noise type and offers optimum cooling.

Adjustable exciter agc feedback circuitry permits drive power to be automatically controlled at proper levels to prevent peak clipping and cw overdrive. Front panel control.

By-pass switching is included for straight through, low power operation without having to turn off amplifier.

Bandpass tuned input circuitry for low distortion and 50 ohm input impedance.

Amplifier is comprised of two units—rf deck for desk top and separate power supply.

Operates from 120/240 V ac, 50/60 Hz primary line voltage.

DRAKE L-7 SPECIFICATIONS

Frequency Coverage*: Ham bands 160 through 15 meters. Non-amateur frequencies between 6.5 and 21.5 MHz may be covered with some modification of the input circuit.

Plate Power Input: 2000 Watts PEP on SSB and 1000 Watts DC on CW, AM, RTTY, and SSTV.

Drive Power Requirements: 100 Watts PEP on SSB and 75 Watts on CW, AM, RTTY, and SSTV.

Input Impedance: 50 Ohms. (Bandpass tuned input)

Output Impedance: Adjustable pi-network matches 50 Ohm line with SWR not to exceed 2:1.

Intermodulation Distortion Products: In excess of −33 dB.

Wattmeter Accuracy: 300 Watts forward and reflected, ± (5% of reading + 3 Watts). 3000 Watts forward, ± (5% of reading + 30 Watts).

Power Requirements: 240 Volts 50-60 Hertz 15 Amperes, or 120 Volts 50-60 Hertz 30 Amperes.

Tube Complement: Two of 3-500Z or 8802/3-500Z or 8163 or 3-400Z.

Dimensions: Amplifier 13.69"W x 6.75"H x 14.25"D (34.8 x 17.1 x 36.2 cm). **Power Supply** 6.75"W x 7.88"H x 11"D (17 x 20 x 28 cm).

Weight: Amplifier 27 lbs (12.25 kg), **Power Supply** 42.5 lbs (19.3 kg).

*Export model includes coverage of the 10-meter Ham Band.

Sale subject to FCC type acceptance

Drake R-7 Synthesized, General Coverage Receiver

Model 1240

Full general coverage reception, 0-30 MHz, with no gaps or range crystals required.

Continuous tuning all the way from vlf thru hf. Superb state-of-the-art performance on a-m, ssb, RTTY, and cw —and it transceives with the Drake TR-7.

100% solid state broadband design, fully synthesized with a permeability tuned oscillator (PTO) for smooth, continuous tuning.

Covers the complete range 0 to 30 MHz with no gaps in frequency coverage. Both digital and analog frequency readout.

Special front-end circuitry employing a high level double balanced mixer and 48 MHz "up-converted" 1st i-f for superior general coverage, image rejection and strong signal handling performance.

Complete front-end bandpass filters are included that operate from hf thru vlf. External vlf preselectors are not required.

10 dB pushbutton-controlled broadband preamp can be activated on all ranges above 1.5 MHz. Low noise design.

Various optional selectivity filters for cw, RTTY and a-m are switch-selected from the front panel. Ssb filter standard.

Special new low distortion "synchro-phase" a-m detector provides superior international shortwave broadcast reception. This new technique permits 3 kHz a-m sideband response with the use of a 4 kHz filter for better interference rejection.

Tunable i-f notch filter effectively reduces heterodyne interference from nearby stations.

The famous Drake full electronic passband tuning system is employed, permitting the passband position to be adjusted for any selectivity filter. This is a great aid in interference rejection.

Three agc time constants plus "Off" are switch-selected from the front panel.

Complete transceive/separate functions when used with the Drake TR-7 transceiver are included, along with separate R-7 R.I.T. control.

Special multi-function antenna selector/50 ohm splitter is switch-selected from the front panel, and provides simultaneous dual receive with the TR-7. This makes possible the reception of two different frequencies at the same time. Main and alternate antennas and vhf/uhf converters may also be selected with this switching network.

The digital readout of the R-7 may be used as a 150 MHz counter, and is switched from the front panel. Access thru rear panel connector.

The built-in power supply operates from 100, 120, 200, 240 V-ac, 50/60 Hz, or nominal 13.8 V-dc.

The R-7 includes a built-in speaker, or an external Drake MS-7 speaker may be used.

Built-in 25 kHz calibrator for calibration of analog dial.

Low level audio output for tape recorder.

Up to eight crystal controlled fixed channels can be selected. (With Drake Aux-7 installed.)

Optional Drake NB-7A Noise Blanker available. Provides true impulse type noise blanking performance.

Optional accessories available

Model 1531 Drake MS-7 Speaker
Model 7021 Drake SL-300 Cw Filter, 300 Hz
Model 7022 Drake SL-500 Cw Filter, 500 Hz
Model 7023 Drake SL-1800 Ssb/RTTY Filter, 1800 Hz
Model 7024 Drake SL-6000 A-m Filter, 6.0 kHz
Model 7026 Drake SL-4000 A-m Filter, 4.0 kHz
Model 1532 Drake NB-7A Noise Blanker
Model 1536 Drake Aux-7 Range Program/Fixed-Frequency Board

DRAKE R-7 SPECIFICATIONS

Frequency Coverage, continuous tuning (With Drake DR-7 Digital R/O, General Coverage Board)
0 to 30 MHz continuous (With or without Aux-7 board) (No gaps in frequency coverage)

Frequency Coverage, continuous tuning (Without DR-7 Board installed)

0.01 to 0.5 MHz
0.5 to 1.0 MHz
1.0 to 1.5 MHz
1.5 to 2.0 MHz
2.5 to 3.0 MHz
3.5 to 4.0 MHz

Without Aux-7 Board

5.0 to 5.5 MHz
7.0 to 7.5 MHz
14.0 to 14.5 MHz
21.0 to 21.5 MHz
28.5 to 29.0 MHz

Plus any eight additional 500 kHz segments between 0 and 30 MHz when programmed into Aux-7 Board.

Crystal Controlled Fixed Frequencies: Up to eight crystal-controlled fixed frequencies within the 0-30 MHz range with Aux-7 Accessory Board. Proper 500 kHz range for desired fixed frequency is also programmed into Aux-7.

Frequency Stability: Less than 100 Hz drift after temperature stabilization including ±10% line voltage variation.

Digital Readout Accuracy: (DR-7 installed) 15 PPM ± 100 Hz

Analog Dial Accuracy: Better than ±1 kHz when calibrated to nearest calibrator marker.

Modes of Operation: Ssb, cw, RTTY, SSTV, a-m.

Sensitivity (ssb): 1.8-30 MHz Less than .20μV for 10dB S+N/N with preamp on (typically .15μV) (Noise floor typically −134 dBm) Less than .50μV for 10 dB S+N/N without preamp (typically .30μV) (Noise floor typically −128 dBm). .01-1.5 MHz Less than 1.0μV for 10 dB S+N/N

Sensitivity (a-m): 1.8-30 MHz Less than 1.2μV for 10 dB S+N/N @ 30% modulation, preamp on. Less than 2.0μV for 10 dB S+N/N @ 30% modulation, preamp off. .01-1.5 MHz Less than 4.0μV for 10 dB S+N/N @ 30% modulation.

Selectivity (2.3 kHz filter supplied): 2.3 kHz at −6 dB, 4.2 kHz at −60 dB (1.8:1) shape factor. Optional 300 Hz, 500 Hz, 1800 Hz and 4 kHz filters are available as follows:

Accessory Crystal Filters

SL-300 cw filter: 300 Hz @ 6 dB, 700 Hz @ 60 dB
SL-500 cw, RTTY Filter: 500 Hz @ 6 dB, 1100 Hz @ 60 dB
SL-1800 ssb/RTTY Filter: 1800 Hz @ 6 dB, 3600 Hz @ 60 dB
SL-4000 a-m Filter: 4 kHz @ 6 dB, 8.0 kHz @ 60 dB

Ultimate Selectivity: Greater than 100 dB

Strong Signal Handling

Two-tone dynamic range: 99 dB	1.8-30 MHz
Third order intercept point: +20 dBm	preamp off
Two-tone dynamic range: 95 dB	1.8-30 MHz
Third order intercept point: +10 dBm	preamp on

Blocking: >145 dB above noise floor

I-f and Image Rejection: Greater than 80 dB (48.05 MHz 1st i-f) (5.645 MHz 2nd i-f) (50 kHz 3rd i-f)

Agc Performance; Less than 4 dB audio output variation for 100 dB input signal change above agc threshold. Agc threshold is typical .8μV with preamp off and .25μV with preamp on.

Attack time: 1 millisecond. Three selectable release times: Slow—2 seconds; Med—400 m sec; Fast—75 m sec. Also, "Off" position is provided.

Antenna Input Impedance: Nominal 50 ohms

Audio Output: 2.5 watts with less than 10% T.H.D. into nominal 4 ohm load.

Power Requirements: 100/120/200/240 V-ac ±10%, 50/60 Hz, 60 watts or 11.0 to 16.0 V-dc (13.8 V-dc nominal), 3 amps

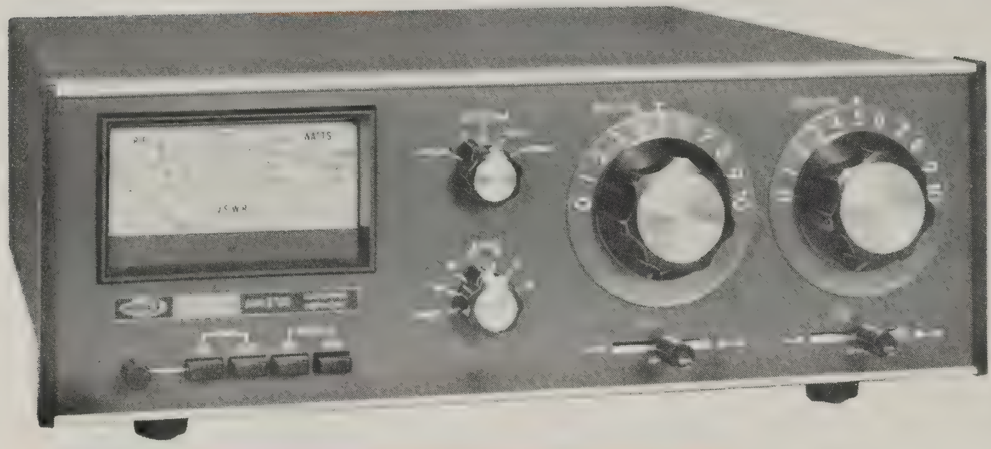
External Counter Mode (DR-7 installed): Readout: to 100 Hz. Accuracy: 15 PPM ±100 Hz. Maximum input frequency: 150 MHz. Input level range: 50 mV to 2 V rms.

Dimensions/Weight:

Depth— 13.0 in (33.0 cm) excluding knobs and connectors.
Width— 13.6 in (34.6 cm)
Height— 4.6 in (11.6 cm) excluding feet
Weight— 18.4 lbs (8.34 kg)

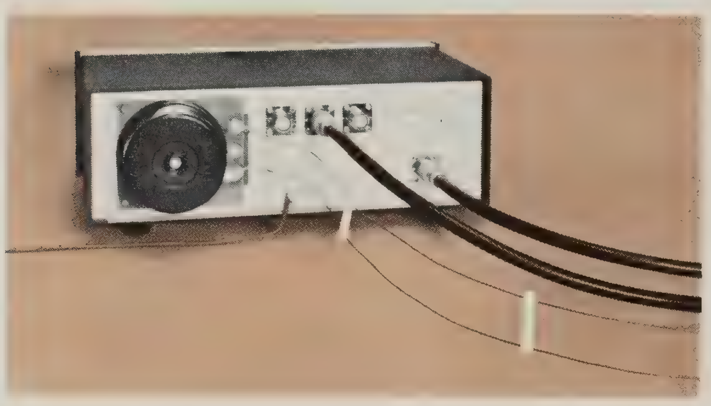
DRAKE® MATCHING NETWORKS

Precision instruments providing rf radiation control and measurement *for your communication system*

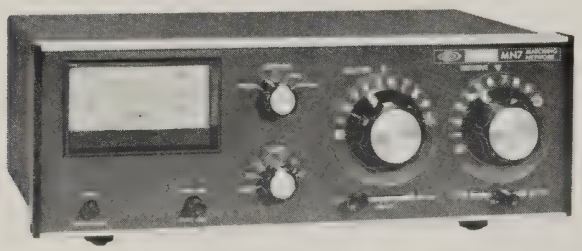


Drake MN-2700 2kW Matching Network

Model 1539



Drake B-1000 Balun Model 1510 installed on Matching Network.



Drake MN-7

Matching Network Model 1538

Same features and specifications as the Drake MN-2700, but rated at 250 watts continuous. Same width and height, but only 8.5″ (21.6 cm) in depth, and weighs 10 lbs. (4.55 kg). Meter reads 0-300 watts forward power or VSWR.

The Drake MN-2700 manages rf radiation in the areas of impedance match to the antenna, rf power measurement, VSWR measurement, reduction of harmonic radiation, and antenna selection.

DRAKE MN-2700 FEATURES

160 thru 10 Meters Frequency Coverage—With out-of-band coverage for MARS, future band expansions and other applications.

Antenna Choice—Matches antennas fed with coax, balanced line, or random wire. (For balanced line use optional Drake B-1000 Balun, which mounts on rear panel of MN-2700.)

Antenna By-pass Switching—Unique design allows unit to be switch-by-passed regardless of which antenna is in use, whether coax or wire type. No need to manually disconnect feedlines. Switch also selects various antennas.

Extra Harmonic Reduction to help fight TVI—Drake Matching Networks employ special "pi-network" low-pass filter type circuitry for maximum harmonic rejection. This feature alone makes the MN-2700 a worthwhile investment; it is a Drake exclusive.

Built-in Metering—Accurate rf wattmeter/VSWR bridge is pushbutton controlled from front panel.

Power Capability—2000 watts PEP, 1000 watts average. Continuous Duty.

Dimensions—13.09″W x 4.53″H x 13″D including connectors (33.26 x 11.5 x 33 cm); **Weight** 11 lbs. (5 kg).

DRAKE MN-2700 SPECIFICATIONS

• **Frequency Coverage:** 1.8 to 30 MHz. Band Switch marked for 160, 80, 40, 20, 15, and 10 meter amateur bands; however, frequency coverage between amateur bands is possible by using the nearest band positions with a small reduction in matching capability. • **Input Impedance:** 50 ohms (resistive). • **Load Impedance:** 50 ohm coaxial with VSWR of 5:1 or less at any phase angle (3:1 on 10 meters). 75 ohm coaxial at a lower VSWR can be used. • **Balanced Feedlines:** With the Drake B-1000 accessory balun, which mounts on rear panel, tunes feed point impedances of 40 to 1000 ohms, or 5:1 VSWR referenced to 200 ohms (3:1 on 10 meters). • **Long-Wire Antennas** Feed point impedances up to 5:1 VSWR referenced to 50 ohms. Also, 5:1 referenced to 200 ohms with the Drake B-1000 accessory balun (3:1 on 10 meters). • **Meter:** Reads VSWR or forward power, 0-200 watts or 0-2000 watts. • **Wattmeter Accuracy:** ±5% of reading ±1% of full scale. • **Insertion Loss:** 0.5 dB or less on each band after tuning. • **Front Panel Controls:** Provide for the adjustment of resistive and reactive tuning, antenna switching, band switching, VSWR calibration, and selection of watts or VSWR functions of the meter. • **Rear Panel Connectors:** The rear panel has four type SO-239 connectors (one for input and 3 for outputs), three screw terminal connections (for long-wire and open-wire feeder systems), and a ground post.

5/79

AMATEUR EQUIPMENT PRICE LIST

Prices Effective: May 14, 1979

R.L. Drake Company, 540 Richard Street, Miamisburg, Ohio 45342
Sales Office Phone: 513-866-2421 Telex: 288-017

Model Number	Drake Model	Description	Suggested Amateur Net
Receivers (Communications) and Accessories			
1242	DSR-2	Vlf-Hf Digital Synthesized Communications Laboratory Receiver, ssb, a-m, cw, isb, RTTY	$3200.00
1240	R-7/DR-7	0-30 MHz General Coverage, Synthesized Digital Readout Receiver	1295.00
1241	R-7	Amateur Band, Analog Readout Receiver (160-10 meters)	1100.00
1532	NB-7A	Noise Blanker for R-7	90.00
1211	R-4C	Amateur Hf Receiver, 160-10 meters	699.00
1217	4-NB	Noise Blanker for R-4C	74.00
7011	FL250	Accessory I-f Filter	52.00
7013	FL500	Accessory I-f Filter	52.00
7015	FL1500	Accessory I-f Filter	52.00
7017	FL4000	Accessory I-f Filter	52.00
7019	FL6000	Accessory I-f Filter	52.00
Transmitters			
1411	T-4XC	Amateur Hf Transmitter 160-10 meters	699.00
Transceivers and Accessories			
1337	TR-7	Transceiver	1200.00
1530	DR-7	General Coverage/Digital Readout for TR-7/R-7	195.00
1336	TR-7/DR-7	General Coverage Digital R/O Transceiver	1395.00
1338	RV-7	Remote VFO	195.00
1536	Aux-7	Range Program Board for TR-7/R-7	45.00
1537	NB-7	Noise Blanker for TR-7	90.00
1529	FA-7	Fan	25.00
7021	SL-300	Cw Filter, 300 Hz for TR-7/R-7	52.00
7022	SL-500	Cw Filter, 500 Hz for TR-7/R-7	52.00
7023	SL-1800	Ssb/RTTY Filter, 1.8 kHz for TR-7/R-7	52.00
7024	SL-6000	A-m Filter, 6.0 kHz for TR-7/R-7	52.00
7026	SL-4000	A-m Filter, 4.0 kHz for TR-7/R-7	52.00
1335	MMK-7	Mobile Mounting Kit	49.95
1330	UMK-3	Remote Trunk Kit for UV-3	69.95
1340*	UV-3	144 Synthesized Fm Transceiver	595.00
1343*	UV-3	144-220 Synthesized Fm Transceiver	795.00
1344*	UV-3	144-440 Synthesized Fm Transceiver	795.00
1346*	UV-3	144-220-440 Synthesized Fm Transceiver	995.00

**Prices above include factory installed modules for bands as listed.*

Factory installed "add-on" 220 or 440 modules. (Done by Service Dept. only. Modules not sent to field.) These modules expand coverage of models which may have been purchased in single band or two band configurations. Contact Service Dept. for return authorization 200.00

PRICES, AVAILABILITY AND SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE OR OBLIGATION

Orders of less than $15.00 subject to $1.00 handling charge.

(Continued on back)

5/79

Model Number	Drake Model	Description	Suggested Amateur Net
Tranceivers and Accessories (continued)			
1339	1339	Remote Control Head — UV-3	$ 90.00
Power Supplies			
1501	AC-4	120/240 V-ac Power Supply for all Drake 4-line equipment	150.00
1504	PS-3	120/240 V-ac Power Supply for Drake UV-3	89.95
1502	PS-7	120/240 V-ac Power Supply for Drake TR-7	249.00
Major Accessories and Miscellaneous			
1528†	L-7	2 kW Linear Amplifier (160-10 meters*)	1099.00
1538	MN-7	Antenna Matching Network, 160-10 meters, 250 watts	165.00
1539	MN-2700	Matching Network, 160-10 meters, 2 kW	279.00
1510	B-1000	4:1 Balun designed for use with MN-4C/MN-7/MN-2700	24.95
1511	MS-4	Matching Speaker for R-4B, R-4C, SPR-4, SW-4A, TR-4 & TR-6	33.00
1531	MS-7	Matching Speaker for TR-7/R-7	36.00
1514	WH-7	Hf Wattmeter/VSWR Bridge 1.8 to 30 MHz	89.00
1525	1525EM	Drake Push Button Encoding Microphone for UV-3 and TR-33C	49.95
7037	7037	Service/Extender Board Kit for TR-7	50.00
7073	7073	Mobile Microphone with plug for TR-7	19.00
7077	7077	Desk Microphone with plug for TR-7	45.00
1550	DL-300	Dummy load 300 watts, no oil required	19.95
1551	DL-1000	Dummy Load 1000 watts, no oil required	39.95
Crystals			
7020		Crystals for 2-C, R-4B, R-4C, SW-4A, T-4XB, T-4XC, SPR-4, ML-2	7.50
		Crystals for fixed frequency operation of tunable units/2-NT	9.50
		Crystals for TR-22	8.00
		Crystals for TR-72 & TR-33C	8.00
Filters for TV-sets			
1603	TV-300-HP	High Pass Filter, 300 ohms Twin-Lead	10.60
1610	TV-75-HP	High Pass Filter, 75 ohms TV Coax	13.25
Low Pass Filters for Transmitters			
1605	TV-42-LP	For transmitting below 30 MHz, 100 watt continuous, 50 ohms, SO-239 Connectors	14.60
1608	TV-3300-LP	1000 watts continuous to 30 MHz with sharp cutoff above 30 MHz	26.60
1609	TV-5200-LP	1000 watts continuous to 30 MHz 100 watts continuous on 6 meters	26.60
Books			
		All Operators' Manuals except DSR-2	10.00
		DSR-2 Manual	20.00
385-0002		UV-3 Service Manual	25.00
385-0004		TR-7 Service Manual	30.00

* * *

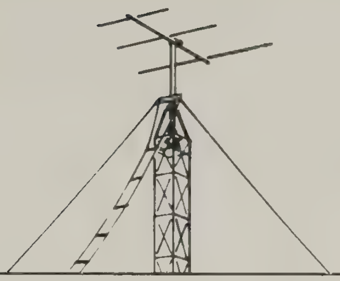
† Sale of L-7 subject to FCC Type Acceptance.

* 10 meters on export units only.

PRICES, AVAILABILITY AND SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE OR OBLIGATION

Orders of less than $15.00 subject to $1.00 handling charge.

really a “secret weapon” for 160 meter enthusiasts!



The Drake MN-2700 and MN-7 Matching Networks have a truly unique antenna feed switching design

Both matching networks will completely change the mode of a balanced-line fed 135 foot doublet to a special configuration that provides very effective 160 meter performance. And best of all, it's done with the simple flip of a switch on the front panel.

Consider a typical all-band antenna set-up—a 135 foot doublet, center-fed with 60 to 70 feet of balanced line at a height of 45 to 60 feet. The Drake MN-2700/B-1000 or MN-7/B-1000 will match this as a true balanced system on 80 thru 10 meters. (Fig. 1)

But what about 160 meters? Many amateurs recommend tying the feeders together and using the antenna as a vertical with a "top-hat." In fact, we suggest this ourselves in our manual.

However, the use of this, or any vertical, assumes you have a good ground or radial system for efficient operation. If you do not have enough room or do not wish to install such a radial system, performance may suffer. And if you do have radials, you still have to change the feeder connections each time you operate 160 meters.

On the other hand, when you use the MN-2700/B1000 or MN-7/B-1000 simply leave the feeders in the balanced connection as you would for 80 thru 10, and move the special antenna selector switch to Position No. 4. This automatically converts half of the antenna and feedline to an inverted "L", fed through a 4:1 impedance transformer, with the other half operating as a counterpoise. (Fig. 2)

This system offers the convenience of "stay in your chair" operation, while providing an effective means of operating 160 meters with a relatively small antenna.

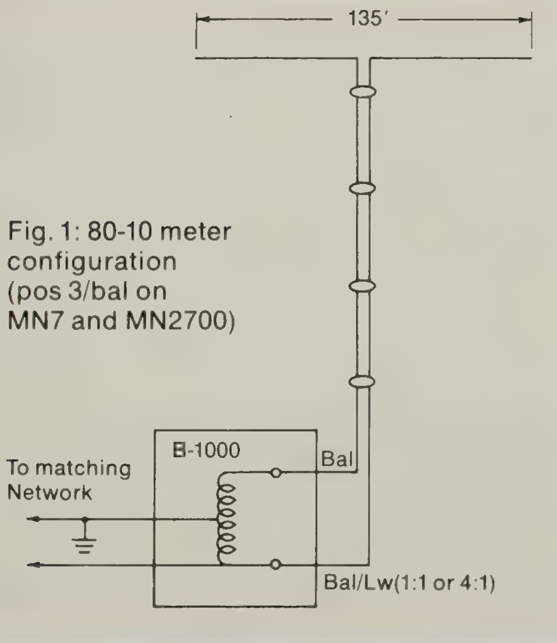


Fig. 1: 80-10 meter configuration (pos 3/bal on MN7 and MN2700)

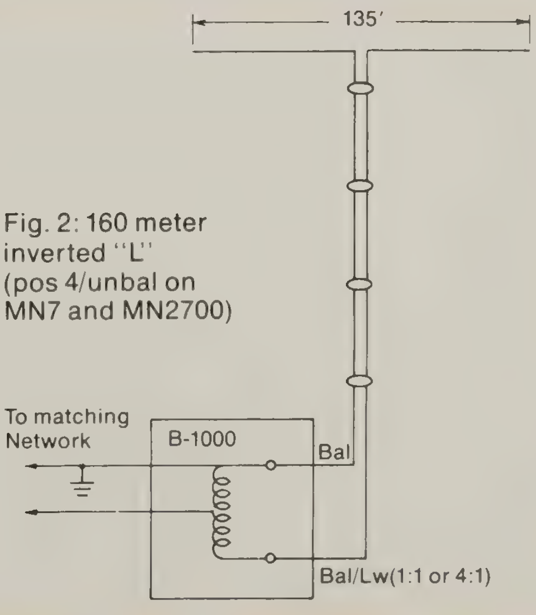


Fig. 2: 160 meter inverted "L" (pos 4/unbal on MN7 and MN2700)

R. L. DRAKE COMPANY

540 Richard St., Miamisburg, Ohio 45342, USA
Phone: (513) 866-2421 • Telex: 288-017

MAY, 1979

R. L. DRAKE • MODEL

TR-4

SIDEBAND TRANSCEIVER

Drake designs bring the radio amateur "more performance at lower cost, thru engineering."

The TR-4 is engineered for optimum performance on upper or lower sideband, AM and CW.

Compact and lightweight, it is ideal for limited space, for mobile, for vacations, and for portable excursions. With 300 watts P.E.P. input it will give a good account "barefoot" and will drive high power "ham" linears. The accessory RV-3 Receiving VFO solves problem of working DX and stations operating on frequencies other than your transmitting frequency.

FEATURES:

Full Frequency Coverage All amateur bands 10 through 80 meters—additional crystals not required

Upper and Lower Sideband on all bands

VOX or PTT on AM and SSB

Automatic Transmit Receive Switching on CW —sometimes called "semi" break-in

CW Sidetone Oscillator built-in

Diode Detector for AM reception

Solid State VFO with linear permeability tuning for maximum stability

Output Impedance adjustable with pi-network

300 Watts P.E.P. input on SSB

Controlled Carrier Screen Modulator for AM built-in

Shifted Carrier CW, 260 watts input

Two Special 9 Mc Crystal Filters for sideband selection

Separate RF and AF Gain Controls

Full AGC with Drake dual time constant system

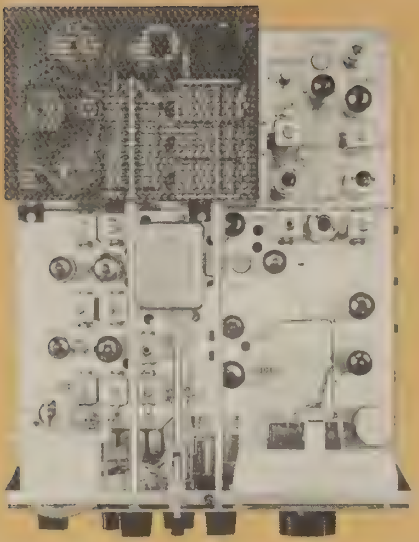
2.1 KC Passband

100 KC Crystal Calibrator built-in

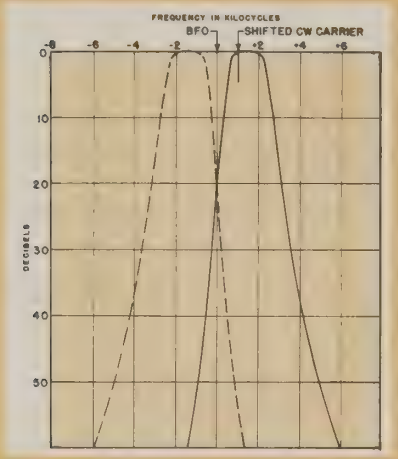
Separate Receiver S-Meter and Transmitter Plate Ammeter

Relative RF Output Indication

DRAKE MODEL TR-4

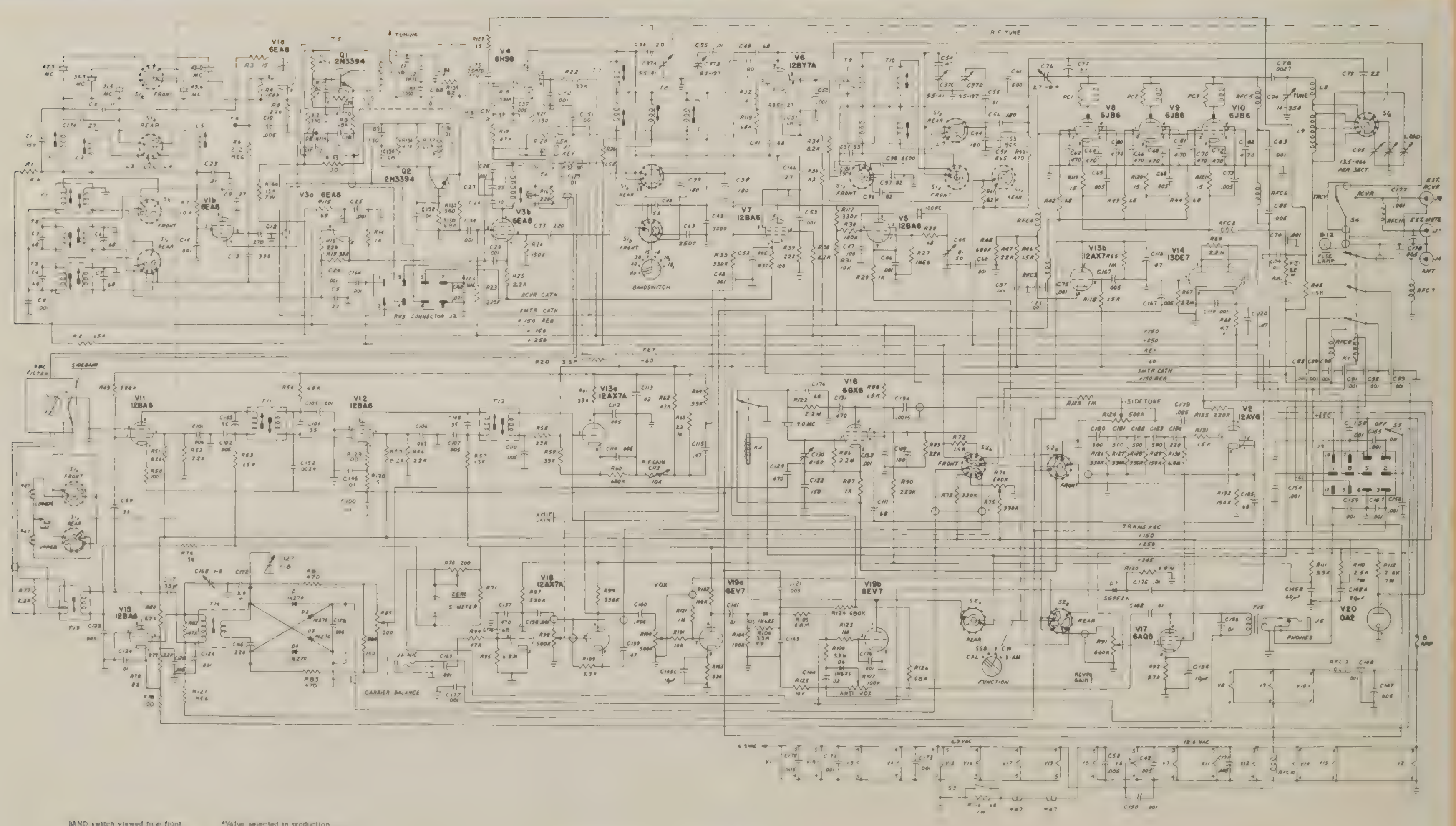


Top view, TR-4 with cover removed.



Selectivity curve, 9 Mc Crystal Filters.

$585.00
AMATEUR NET



BAND switch viewed from front
in 80 meter position
Resistors are 1/2 watt 10% except
where noted
Highest capacitor C 192
Highest resistor R 140

*Value selected in production
Capacitor values from 1 to 1000 are
in m m f and those from .001 up are
in m f d unless otherwise noted
J² and J³ shown outside view
** Adjust to change VOX holding time.

SCHEMATIC DIAGRAM
Model TR-4 Sideband Transceiver

SIDEBAND TRANSCEIVER

GENERAL SPECIFICATIONS:

FREQUENCY COVERAGE: Full coverage on all amateur bands 10 thru 80 meters, in seven 600 kc ranges: 3.5 to 4.1 mc, 7.0 to 7.6 mc, 13.9 to 14.5 mc, 21 to 21.6 mc, 28 to 28.6 mc, 28.5 to 29.1 mc, 29.1 to 29.7 mc.

SOLID STATE VFO: Has linear permeability tuning. Tunes 4.9 to 5.5 mc for all ranges.

DIAL CALIBRATION: 10 kc divisions on main tuning dial and 1 kc divisions on the tuning knob skirt. Effective length of circular dial scale is over 14 inches.

FREQUENCY STABILITY: High stability solid state VFO tunes same range on all bands. Drift is less than 100 cycles after warm-up, and less than 100 cycles for plus or minus 10% line voltage change.

MODES OF OPERATION: SSB Upper and Lower Sideband, CW and AM.

FRONT PANEL CONTROLS:

"Main Tuning" has fluted knob with adjustable 25 division skirt. Tunes VFO and rotates main dial.

"RF Tune" tunes the RF circuits common to receiver RF amplifier and transmitter driver stages. 0-10 scale.

"Plate and **"Load"** tuning adjust pi-network capacitors in transmitter for proper resonance and loading on each band.

"Band" switch selects desired ham band (see frequency coverage).

"Function" switch has four positions "CAL, SSB, CW, AM." "CAL" operates built-in 100 kc crystal calibrator for accurate setting of main tuning hair line indicator and knob skirt. "SSB" provides SSB operation, either VOX or PTT. "CW" provides for CW operation with automatic transmit receive switching and CW sidetone, and is used for tune up. "AM" provides for AM operation with VOX or PTT, and with diode detector for receiving.

"Xmtr Gain" functions as mike audio gain on SSB and AM, and as carrier injection control on CW for tune and CW.

"Rcvr Gain" knob controls receiver AF gain and power ON-OFF switch. Lever behind knob controls setting of RF gain.

"Sideband" switch in conjunction with indicator lights marked **"Upper"** and **"Lower"** selects desired sideband by connecting into the circuit either the upper or lower sideband filter.

"Meter" control converts plate ammeter to relative RF output indicator and adjusts its sensitivity.

RIGHT SIDE SCREWDRIVER ADJUST CONTROLS: Vox Gain, Anti-Vox Gain, S-Meter Zero.

RIGHT SIDE JACKS: Headphone (disconnects speaker circuit), Microphone (3-circuit for PTT), Key (normally closed).

REAR CONTROLS: Sidetone gain, Dial light dimmer.

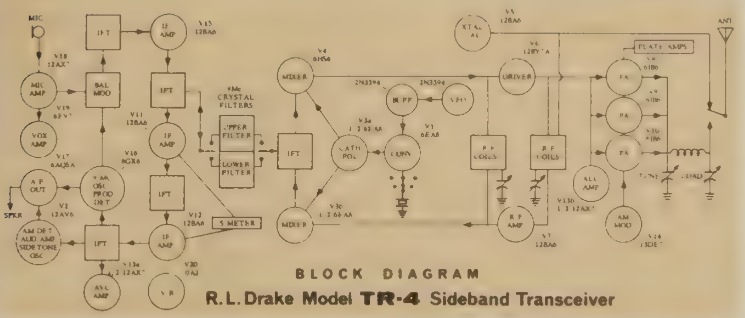
REAR JACKS: Power (connects TR-4 to power supply and speaker), MUTE (for muting an external receiver), EXT RCV (for connecting an external receiver to the antenna), Antenna (for connecting the TR-4 to the antenna).

LEFT SIDE CONTROLS—Transceive/External receive switch (for selecting between the use of the TR-4 or an external receiver.)

INSIDE CONTROLS: Carrier balance.

METERS: Receiver S-meter/transmitting AGC indicator and plate ammeter/relative RF output indicator.

MISC: 20 tubes including voltage regulator; two transistors; 8 diodes; 100 kc crystal calibrator built in; Dimensions: 5½" high, 10¾" wide, 14⅜" deep. Weight: 16 lbs.



BLOCK DIAGRAM
R.L.Drake Model **TR-4** Sideband Transceiver

TRANSMITTER SPECIFICATIONS:

SINGLE SIDEBAND: 300 watts P.E.P. input power, VOX or PTT. Two special 9 mc crystal filters provide upper or lower sideband selection on any band, without the necessity of shifting oscillators. The 9 mc filters are asymmetrical, that is, steeper on the carrier side (see filter selectivity charts) making possible unwanted sideband suppression of more than 40 db and carrier suppression of 50 db. Overall audio frequency response 400 to 2500 cycles at 6 db down. Distortion products 30 db down at maximum output. Amplified AGC.

CW: Power input 260 watts. Carrier is shifted approximately 1000 cycles into one sideband, and mixer and driver are keyed. Grid block keying is free from chirps and clicks. Automatic transmit/receive switching when key is operated. CW sidetone oscillator for monitoring.

AM: Controlled carrier AM screen modulator is built-in. 260 watts P.E.P. input. Low carrier power increases 6 times to 50 watts output at maximum modulation. This system is compatible with SSB linears. VOX or PTT. Diode detector used for receiving on this mode. Product Detector can be used by switching manually.

OUTPUT IMPEDANCE: Nominal 50 ohms, adjustable with pi-network.

MICROPHONE INPUT: High-impedance.

RECEIVER SPECIFICATIONS:

SENSITIVITY: Less than ½ microvolt for 10 db S/N.

I. F. SELECTIVITY: 2.1 kc at 6 db, 7.5 kc at 60 db.

AGC: FULL AGC on received modes—audio ouput varies less than 3 db for 60 db change in signal level. Any amount of AGC from zero to full can be had by adjustment of RF gain control. Time proven Drake AGC system provides fast attack and slow release with noise pulse suppression, no pumping or popping evident.

ANTENNA INPUT: Nominal 50 ohms.

AUDIO RESPONSE: 400 to 2500 cycles at 6 db.

AUDIO OUTPUT POWER: 2 watts.

AUDIO OUTPUT IMPEDANCE: 4 ohms.

POWER SUPPLY REQUIREMENTS: Due to the 300 watt P.E.P. input rating, the TR-4 will require a power supply capable of low voltage at high current with very good dynamic regulation. The voltage and current requirements are as follows:

1. 650 volts at 300 ma average and 500 ma maximum with 10% regulation from 100 ma to 500 ma and maximum ripple of less than 1%.

2. 250 volts at 175 ma with 10% regulation from 150 ma to 180 ma. This includes the effect of the 650 volt supply change if both voltages are obtained from the same transformer. Maximum ripple must be less than ¼%.

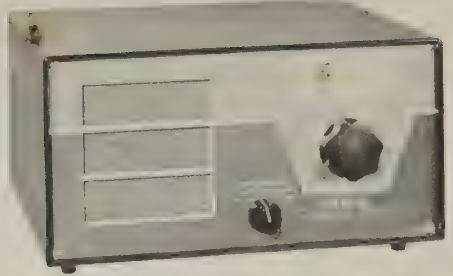
3. —45 to —65 VDC adjustable filtered bias into 33K ohm load.

4. 12.6 Volt AC or DC at 5.5 amps.

TUBE or TRANSISTOR	FUNCTION	
	Transmitter	Receiver
12AX7	Mike Amp.	—
6EV7	Vox Amp./Relay	—
6GX6	9 MC Xtal Osc.	BFO/Prod. Det.
12BA6	I. F. Amp.	—
12BA6	—	I. F. Amp.
12BA6	—	I. F. Amp.
12AX7	AGC	AGC
6AQ5A	Anti-Vox	Audio Output
6HS6	Mixer	—
6EA8	Cathode Fol.	Mixer/Cath. Fol.
6EA8	Pre-Mixer/Xtal Osc.	Pre-Mixer/Xtal Osc.
12AV6	Sidetone Osc.	Diode det/1st AF amp.
13DE7	AM Screen Mod.	—
12BA6	—	R. F. Amp.
12BA6	—	Crystal Calib.
12BY7A	Driver	—
(3) 6JB6	Power Amps	—
OA2	Voltage Reg.	Voltage Reg.
2N3394	VFO	VFO
2N3394	VFO Buffer	VFO Buffer

ACCESSORIES

All Accessories can be used with either TR-4 or TR-3



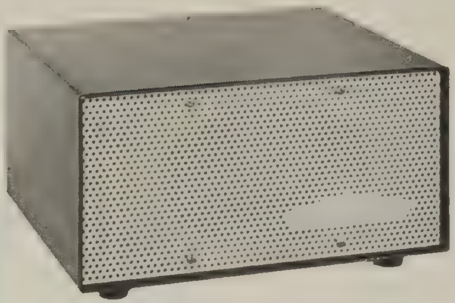
REMOTE VFO

Model RV-3 . . . $79.95

Consists of same VFO and calibrated dial as TR-3, cathode follower, voltage regulator, and required control circuitry to permit reception, transmission, or transceiver operation on a separate frequency in the same band to which the TR-4 is tuned. All these functions performed without retuning TR-4 VFO. Includes 5-inch speaker, 3-foot interconnecting cable, and space for AC Power Supply.

Dim.: 5⅜"h, 10¾"w, 11⅛"d.

Weight 8½ lbs.



MATCHING SPEAKER

Model MS-4 . . . $19.95

Contains a 5 x 7 inch heavy magnet speaker and connecting cable. Styled to match TR-4 Transceiver. Space for mounting AC power supply in rear.

Dim.: 5⅜" h, 10¾" w, 11⅛" d.

Weight: 6 lbs.

POWER SUPPLIES

AC Power Supply
Model AC-3 $79.95

Designed to supply all voltage and current requirements for the TR-4. Seven silicon diode rectifiers. 120 volt 50/60 cycle. Has 5 ft. interconnecting cable with 12-prong connector and speaker connector. Will mount in rear of MS-4 and RV-3 cabinets.

Dimensions: 5" x 5" x 10¼".

Weight: 15 lbs.

DC Power Supply
Model DC-3 $129.95

Transistorized. Operates from 12 VDC. Supplies all voltage and current requirements for the TR-4. Has 5 ft. interconnecting cable and speaker connector.

Dimensions: 3⅜"h, 4⅜"w, 8"d.

Weight: 7½ lbs.

MOBILE MOUNTING KIT Model MMK-3 $6.95

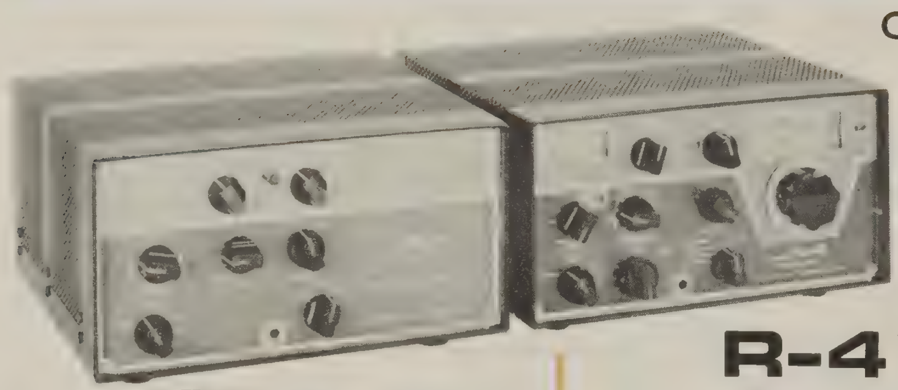
Contains brackets and hardware for under-dash or hump mounting TR-4 in practically all cars. Weight 1 lb.

DRAKE TR-4 Operating and Instruction MANUAL Price **$2.00** Postpaid in U.S.A.

OTHER DRAKE PRODUCTS

TVI Filters

TV-300-HP	High Pass Filter . .	$ 3.97
TV-1000-LP	Low Pass Filter . .	16.95
TV-100-LP	Low Pass Filter . . .	5.95
TV-CB-LP	Citizen Band Low Pass	6.95
TV-300-FMT	FM Band Rejection	2.55



T-4 RECITER

Transceives with R-4 Receiver.

Model T-4 $269.95 Amateur Net

Covers all Ham Bands 160 thru 10 meters.

Covers MARS and Other Frequencies between ham bands.

Upper and Lower Sideband on all frequencies.

Automatic Transmit Receive Switching on CW (semi break-in).

Controlled Carrier Modulation for AM is completely compatible with SSB linear amplifiers.

VOX or PTT on SSB and AM built-in.

Adjustable Pi-Network Output.

Two Crystal Lattice Filters for sideband selection, 2.4 Kc bandwidth.

Transmitting AGC prevents flat topping.

Shaped Grid Block Keying with side tone output.

200 Watts PEP Input on SSB—180 watts input CW.

Meter indicates plate current and relative output.

R-4 RECEIVER

Model R-4 $379.95 Amateur Net

Linear permeability tuned VFO with 1 Kc dial divisions. VFO and crystal frequencies pre-mixed for all-band stability.

Covers ham bands 80, 40, 20, 15 meters completely and 28.5 to 29.0 Mc of 10 meters with crystals furnished.

Any ten 500 Kc ranges between 1.5 and 30 Mc can be covered with accessory crystals for 160 meters, MARS, etc. (5.0-6.0 Mc not recommended).

Four bandwidths of selectivity, 0.4 Kc, 1.2 Kc, 2.4 Kc and 4.8 Kc.

Passband tuning gives sideband selection, without retuning.

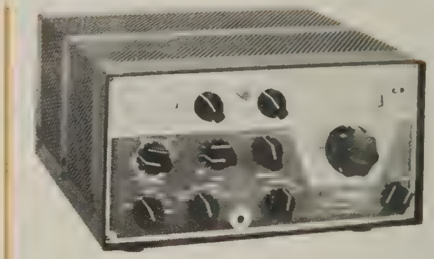
Noise blanker that works on CW, SSB, and AM is built-in.

Notch filter is built-in.

100 Kc crystal calibrator is built-in.

Product detector for SSB/CW, **diode detector** for AM.

Crystal Lattice Filter gives superior cross modulation and overload characteristics.



DRAKE T-4X

Complete Transmitter

(Less Power Supply)

All T-4 features plus

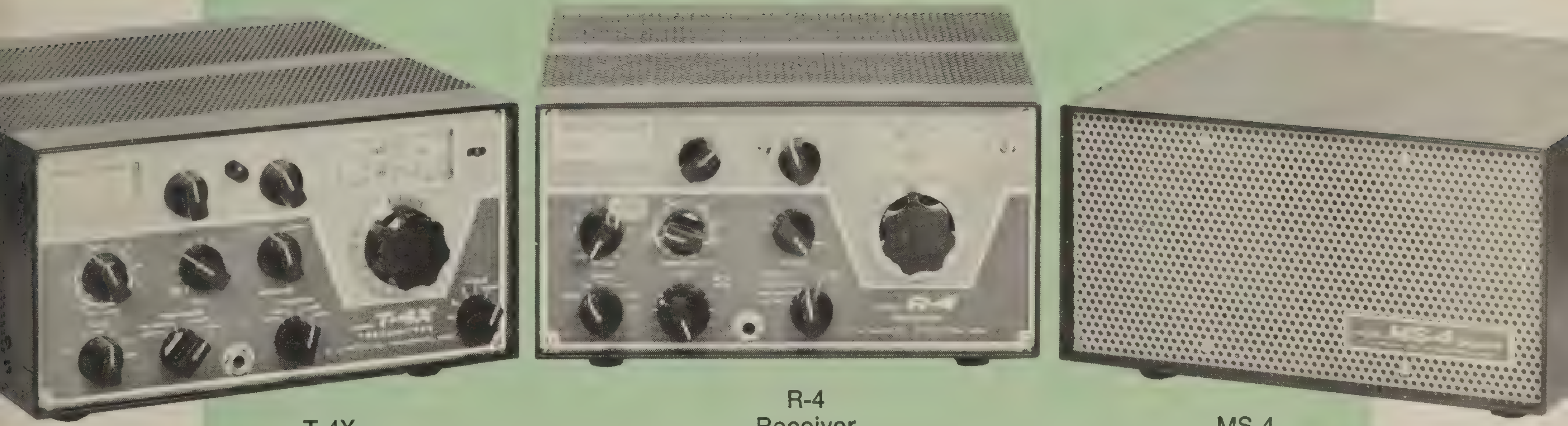
- Solid State VFO and
- XTAL Oscillators . . .

$379.95 Amateur Net

All prices are amateur net.
See your distributor or write: **R. L. DRAKE COMPANY** MIAMISBURG, OHIO 45342

Superior combinations for Transceiving...

DRAKE 4 LINE



T-4X
Transmitter

R-4
Receiver

MS-4
Speaker

Combine advantages of transceiving with the versatility possible only with a complete communications receiver. All features are included which are necessary for the utmost in receiver and transmitter performance.

Transceive frequency control by VFO of either T-4X or R-4, or separate receiver/transmitter frequency control, selectable by a front panel switch on the T-4X. No "cable juggling" necessary. This feature is most useful for "DX chasing," traffic net operation, etc.

Accurate Frequency Readout: Both units have linear, permeability tuned VFO's readable to better than 1 Kc.

Rock Solid Stability, both mechanical and electrical.

Continuity of Style and Compact Size for eye appeal, convenience and portability.

Variety of Operation: provides maximum effectiveness of operation on SSB, CW, and AM, and is easily adaptable to RTTY.

Automatic Transmit/Receive Switching on CW activates transmitter and mutes receiver when key is depressed. (Sometimes called "semi break-in.")

DRAKE R-4 RECEIVER

$379.95 AMATEUR NET

R-4 FEATURES

- **Linear permeability tuned VFO** with 1 Kc dial divisions.
- **Covers ham bands** 80, 40, 20, 15 meters completely and 28.5 to 29.0 Mc of 10 meters with crystals furnished.
- **Also covers 160 meters,** Mars, Citizens Band, WWV, Marine, and short wave broadcasts. (With accessory crystals.)
- **Or will give 5 Mc of continuous coverage** (with accessory crystals) for use with VHF converters.
- **Or tunes any ten 500 Kc ranges** between 1.5 Mc and 30 Mc with accessory crystals; 5.0 to 6.0 Mc not recommended.
- **Four bandwidths** of selectivity (equivalent to 4 filters) are furnished: 0.4 Kc, 1.2 Kc, 2.4 Kc and 4.8 Kc.
- **Passband tuning**
- **Noise blanker** that works on CW, SSB, and AM; **Notch filter** and **100 Kc crystal calibrator** are built in.
- **Crystal lattice filter 1st IF** prevents cross-modulation due to strong adjacent channel signals.
- **Premixed injection** — Crystal oscillator and low frequency VFO outputs premixed.
- **AVC with fast attack and slow release** for SSB or fast release for high speed break-in CW. Also AVC may be switched off.
- **Receives SSB, AM, CW, and RTTY** with full RF gain, complete AVC action and accurate S-meter indication.
- **Product detector** for SSB/CW — diode detector for AM.
- **Excellent overload and cross modulation characteristics;** insensitive to operation of nearby transmitters.
- **Transceive capability;** May be used to transceive with the T-4 "Reciter" or T-4X Transmitter.

ACCESSORIES (See page 4).

SPECIFICATIONS — R-4

FREQUENCY COVERAGE: 3.5-4.0 Mc, 7.0-7.5 Mc, 14.0-14.5 Mc, 21.0-21.5 Mc, and 28.5-29.0 Mc with crystals supplied. Ten accessory crystal sockets are provided for coverage of any 10 additional 500 Kc ranges between 1.5 and 30 Mc with the exception of 5.0-6.0 Mc.

SELECTIVITY: Drake tunable passband filter provides:
0.4 Kc at 6 DB down and 2.6 Kc at 60 DB down, 1.2 Kc at 6 DB down and 4.8 Kc at 60 DB down, 2.4 Kc at 6 DB down and 8.2 Kc at 60 DB down, 4.8 Kc at 6 DB down and 25 Kc at 60 DB down.
Selectivity switching is independent of detector and AVC switching.

I.F. FREQUENCIES: First I.F., 5645 Kc crystal lattice filter; second I.F., 50 Kc tunable L/C filter.

STABILITY: Less than 100 cycles after warm up. Less than 100 cycles for 10% line voltage change.

SENSITIVITY: Less than ½ uv for 10 DB signal plus noise to noise on all amateur bands.

MODES OF OPERATION: SSB, CW, AM, RTTY.

DIAL CALIBRATION: Main dial calibrated 0 to 500 Kc and 500 to 1000 Kc in 5 Kc divisions. Vernier dial calibrated 0 to 25 Kc in 1 Kc divisions. **CALIBRATION ACCURACY:** Better than 1 Kc when calibrated at nearest 100 Kc point.

AVC: Amplified delayed AVC having slow (.75 sec.) or fast (.025 sec.) discharge; less than 100 microsecond charge. AVC can also be switched off. 3 DB change in AF output with 60 DB change in RF input.

AUDIO OUTPUT: 1.4 watts max. and .5 watts at AVC threshold. **AUDIO OUTPUT IMPEDANCE:** 4 Ohms and hi impedance for anti-vox.

ANTENNA INPUT: Nominal 52 Ohms.

SPURIOUS RESPONSES: Image rejection more than 60 DB. I.F. rejection more than 60 DB on ham ranges. Internal spurious responses in ham ranges less than the equivalent 1 uv signal on the antenna.

CONTROLS AND JACKS:

Front: Main tuning, AF gain, RF gain, AM—SSB/CW with slow AVC, fast AVC, or AVC off, function switch, band switch, xtal switch, passband tuning and selectivity, preselector, notch, and headphone jack.

Rear: S-meter zero, antenna jack, speaker jack, mute jack, anti-vox jack, accessory power socket, and fuse post.

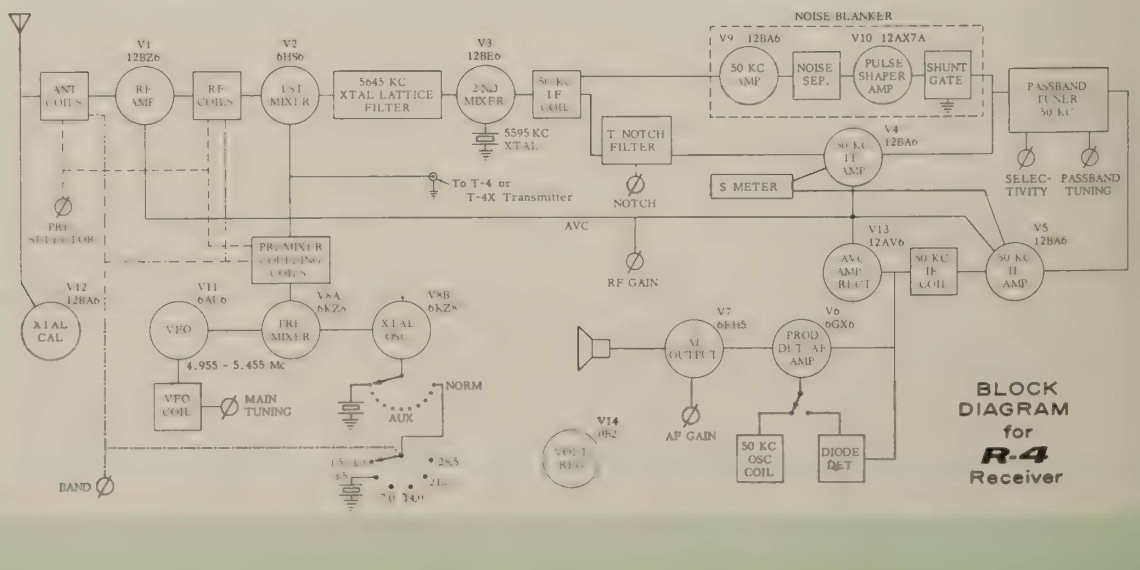
Side: Notch adjust and noise blanker threshold.

POWER CONSUMPTION: 60 watts. 120/240 VAC, 50/60 cycles.

DIMENSIONS: 5½" high, 10¾" wide, cabinet depth 11⅝", overall length 12¼", weight 16 lbs.

R-4 TUBES & SEMI-CONDUCTORS

12BZ6	RF amp.
12BA6	100 Kc calibrator
6HS6	1st mixer
6AU6	VFO
6KZ8	Premixer/xtal osc.
12BE6	2nd mixer and xtal osc.
12BA6	50 Kc IF
12BA6	50 Kc IF
12AV6	AVC amp./AVC det.
6GX6	Prod. det./audio amp.
6EH5	Audio Output
12BA6	Noise blanker amp.
12AX7	Noise blanker pulse amp./shaper
SG952A	Noise blanker gate
2-SG952A	Noise blanker pulse clippers
SG952A	AM detector
ED3004	Bias rectifier
2-ED3004	Power supply rectifiers
OB2	Voltage regulator



BLOCK DIAGRAM for R-4 Receiver

DRAKE
T-4X
TRANSMITTER

$379 95 AMATEUR NET

SPECIFICATIONS — T-4X

FREQUENCY COVERAGE: 3.5-4.0 Mc, 7.0-7.5 Mc, 14.0-14.5 Mc, 21.0-21.5 Mc, and 28.5-29.0 Mc with crystals supplied. Four accessory crystal sockets are provided for coverage of additional 500 Kc ranges between 1.8 and 30.0 Mc.

DIAL CALIBRATION: Main dial calibrated 0 to 500 Kc and 500 to 1000 Kc in 5 Kc divisions. Vernier dial calibrated 0 to 25 Kc in 1 Kc divisions. **CALIBRATION ACCURACY:** Better than 1 Kc when calibrated to nearest 100 Kc point.

STABILITY: Less than 100 cycles after warm up. Less than 100 cycles with 10% change in line voltage.

MODES OF OPERATION:

SSB: Upper or lower sideband on all bands. VOX or push-to-talk.

CW: Grid-block keying, VOX circuit is keyed for automatic transmit-receive switching. Sidetone oscillator is keyed for monitoring. Shifted carrier system has no spurious output.

AM: Controlled carrier AM modulation is built-in. This system is compatible with SSB linear amplifiers. Vox or push-to-talk.

RTTY: VFO easily adaptable to FSK. Signal frequency shifts same direction on all bands and same amount on all bands with a given dial setting.

SIDEBAND SUPPRESSION: 40 DB above 750 CPS. **CARRIER SUPPRESSION:** 60 DB or better.

AVERAGE DISTORTION PRODUCTS: in excess of 30 DB down.

FREQUENCY RESPONSE: 300 to 2600 cycles at 6 DB down.

INPUT POWER: SSB and AM—200 watts PEP, CW—200 watts.

OUTPUT IMPEDANCE: Nominal 52 ohms adjustable with pi network. (SWR should be 2:1 or less.)

MICROPHONE INPUT: High impedance.

AGC: Operates on SSB to prevent flat topping due to overdrive.

CONTROLS AND JACKS:

Front: Main tuning, accessory crystal switch, function switch, sideband selector, band switch, RF tune, gain, plate tuning, plate loading, transceive switch, plate current/relative output meter switch and microphone jack.

Side: Anti-VOX/Sidetone gain and VOX gain.

Rear: Power connector, mute jack, receiver antenna jack, Anti-VOX/Sidetone jack, key jack, antenna connector, ground post and R-4 injection jack.

Inside: Carrier balance control.

POWER REQUIREMENTS: Model AC-3 power supply.

DIMENSIONS: 5½" high, 10¾" wide, cabinet depth 11⅝", overall length 12¼", weight 14 lbs.

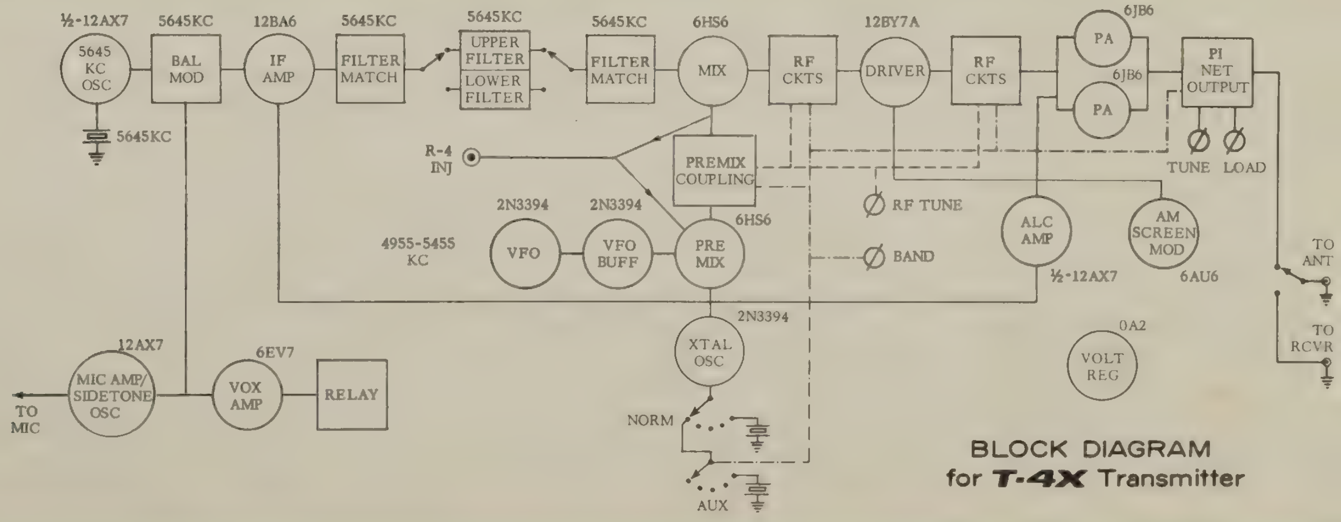
T-4X FEATURES

- **Solid State Linear permeability tuned VFO** with 1 Kc divisions. Gear driven circular dial. High mechanical, electrical, and temperature stability.
- **Covers hambands 80, 40, 20, and 15 meters** completely and 28.5-29 Mc of 10 meters with crystals furnished.
- **160 Meters covered** with accessory crystal. Also certain other 500 Kc ranges between 1.8 and 30 Mc are available. Could include MARS, other 10 meter ranges, or VHF with transmitting converters.
- **Will transceive with R-4 Receiver** — Switch on T-4X determines frequency control by R-4 or T-4X VFO, or provides independent frequency control.
- **Upper or lower sideband** on all bands.
- **Automatic transmit receive switching on CW.** (Semi break-in)
- **Controlled carrier modulation** for AM is completely compatible with SSB linear amplifiers.
- **VOX or PTT**
- **Adjustable pi network output**
- **Two special crystal lattice filters** for sideband selection.
- **Transmitting AGC** prevents flat topping.
- **Meter reads relative output and plate current** selectable with front panel meter switch.
- **Built-in CW Sidetone**
- **Spotting Function** provided for easy zero-beating.
- **Easily adaptable to RTTY**
- **Compact size; rugged construction.**

ACCESSORIES (See page 4).

T-4X TUBES & SEMI-CONDUCTORS

2N3394	VFO
2N3394	VFO buffer
2N3394	Xtal oscillator
12BA6	I.F. amp.
6HS6	Mixer
12BY7A	Driver
2-6JB6	Power amp.
12AX7	Mic. amp./ sidetone osc.
6EV7	VOX amp.
6HS6	Premixer
6AV6	AM modulator
12AX7	ALC amp. carrier osc.
OA2	Voltage regulator
2-SG952A	VOX and Anti-VOX rect.
4-IN270	Balance modulator
SG952A	Trigger
2-SG952A	Keying
IN270	Output meter det.
ERV-10	Voltage regulator



BLOCK DIAGRAM for **T-4X** Transmitter

DRAKE T-4 RECITER*

*Receiver-controlled Exciter for use with R-4 Receiver

$269.95 AMATEUR NET

The T-4 is identical to the T-4X except that the VFO, HF oscillator and their associated control circuitry have been omitted.

The T-4 operates with the R-4 receiver to provide transceive operation on the frequency to which the R-4 is tuned, or will transmit crystal-controlled for DX, net, or novice use.

4-LINE ACCESSORIES

Model AC-3	AC Power Supply for T-4 or T-4X (can be housed in MS-4 cabinet)	**$79.95**
Model MS-4	Matching Speaker for use with R-4 Receiver (has space to house AC-3)	**$19.95**
Crystals	For T-4X xmtr or R-4 rcvr, each	**$ 5.00**

OTHER DRAKE PRODUCTS

TR-4 ACCESSORIES

RV-3 Remote VFO for TR-4	**$ 79.95**
MMK-3 Mobile Mounting Kit	**$ 6.95**
Power Supplies **AC-3**	**$ 79.95**
DC-3	**$129.95**

New TR-4 Sideband Transceiver

- All amateur bands 10 thru 80 meters.
- Upper and Lower Sideband on all bands.
- Solid State VFO
- VOX or PTT on AM and SSB.
- Built-in Sidetone and Automatic Transmit/Receive switching on CW.
- Many plus features . . .

$585.00

TVI Filters

TV-300-HP High pass Filter	**$ 3.97**
TV-1000-LP Low Pass Filter	**16.95**
TV-100-LP Low Pass Filter	**5.95**
TV-CB-LP Citizens Band Low Pass	**6.95**
TV-300-FMT FM Band Rejection	**2.55**

All prices amateur net.

Coming soon . . . L-4 Linear Amplifier

R. L. DRAKE COMPANY • MIAMISBURG, OHIO

NEW DRAKE
MODEL T-4X TRANSMITTER

T-4X FEATURES

Linear permeability tuned VFO with 1 KC division can be crystal locked. Gear driven circular dial. High mechanical, electrical, and temperature stability.

Covers hambands 80, 40, 20, and 15 meters completely and 28.5 - 29 MC of 10 meters with crystals furnished.

Also four auxiliary ranges 500 KC wide anywhere between 1.5 and 30 MC (except 5.0 to 6.0 MC) can be had with accessory crystals. Could include 160 meters, MARS, other 10 meter ranges, or VHF with transmitting converters.

Will transceive with R-4 receiver on any frequency that the R-4 tunes.

Upper or lower sideband on all bands.

Automatic transmit receive switching on CW. True break-in CW to 60 WPM is possible when used with R-4 receiver.

Controlled carrier screen modulation for AM is completely compatible with SSB linear amplifiers.

VOX or PTT

Adjustable pi network output

Two asymetrical crystal lattice filters for sideband selection.

Transmitting AGC prevents flat topping.

Compact size; rugged construction.

NEW DRAKE
MODEL T-4 RECITER

(Receiver controlled exciter.)

MUST BE USED WITH R-4 RECEIVER

Same unit as T-4X except it has no PTO and associated frequency controlling circuits. It must be used with R-4 receiver. It will work in Transceive Mode only.

The T-4 may be converted into a T-4X by purchasing a kit which includes PTO/crystal osc. module and new front panel.

DRAKE MODEL *T-4X* TRANSMITTER SPECIFICATIONS

FREQUENCY COVERAGE: 3.5-4.0 MC, 7.0-7.5 MC, 14.0-14.5 MC, 21.0-21.5 MC, and 28.5-29.0 MC with crystals supplied. Four accessory crystal sockets are provided for coverage of any four additional 500 KC ranges between 1.5 and 30.0 MC with the exception of 5.0-6.0 MC.

DIAL CALIBRATION: Main dial calibrated 0 to 500 KC and 500 to 1000 KC in 5 KC divisions. Vernier dial calibrated 0 to 25 KC in 1 KC divisions.

CALIBRATION ACCURACY: Better than 1 KC when calibrated to nearest 100 KC point.

STABILITY: Less than 100 cycles after warm up. Less than 100 cycles with 10% change in line voltage.

MODES OF OPERATION:

SSB: Upper or lower sideband on all bands. VOX or push-to-talk.
CW: Grid-block keying, VOX circuit is keyed for automatic transmit-receive switching. Sidetone oscillator is keyed for monitoring. No PA "diode" noise to blanket weak signals when key is up.
AM: Controlled carrier AM screen modulation is built-in. This system is compatible with SSB linear amplifiers. Vox or push-to-talk.
RTTY: PTO easily adaptable to FSK. Signal frequency shifts same direction on all bands and same amount on all bands with a given dial setting.

SIDEBAND SUPPRESSION: 40 DB above 750 CPS

CARRIER SUPPRESSION: 60 DB or better

DISTORTION PRODUCTS: More than 30 DB down at full output.

FREQUENCY RESPONSE: 300 to 2600 cycles at 6 DB down.

INPUT POWER:
SSB - 200 watts PEP
AM - 175 watts PEP
CW - 175 watts

OUTPUT IMPEDANCE: Nominal 52 ohms adjustable with pi network. (SWR should be 2:1 or less.)

MICROPHONE INPUT: High impedance.

AGC: Operates on SSB to prevent flat topping due to overdrive.

CONTROLS AND JACKS:

Front: Main tuning, accessory crystal switch, function switch, sideband selector, band switch, RF tune, gain, plate tuning, plate loading, plate ammeter, microphone jack, and VFO switch.
Side: Locking crystal socket, key jack, VOX gain, ANTI-VOX gain.
Rear: Power connector, mute jack, receiver input jack, ANTI-VOX jack, sidetone jack, antenna connector, ground post.
Inside: Carrier balance control, R-4 injection jack.

POWER REQUIREMENTS: Model AC-3 or AC-4 power supply.

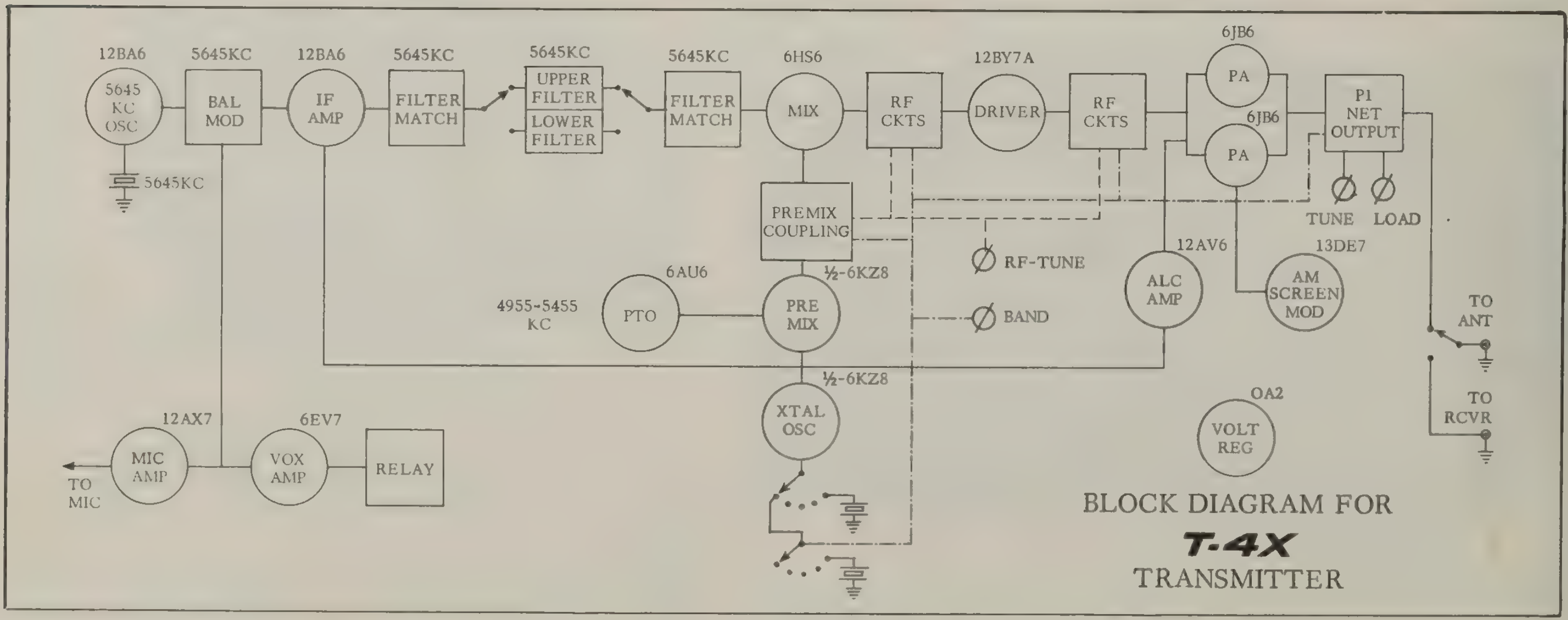
DIMENSIONS: 5½" high, 10¾" wide, cabinet depth 11⅝", overall length 12¼", weight approximately 14 lbs.

TUBE COMPLEMENT:

12BA6	carrier osc.
12BA6	I. F. amp.
6HS6	mixer
12BY7A	driver
2-6JB6	power amp.
12AX7	mic. amp.
6EV7	VOX amp.
6KZ8	premixer/crystal osc.
6AU6	VFO
13DE7	AM screen mod.
12AX7	ALC amp./sidetone osc.
OA2	voltage regulator

PRICES:

T-4X Transmitter.............	$369.95
T-4 Reciter....................	269.95
AC-4 Power Supply (Fits inside MS-4 Speaker Cabinet)........	79.95

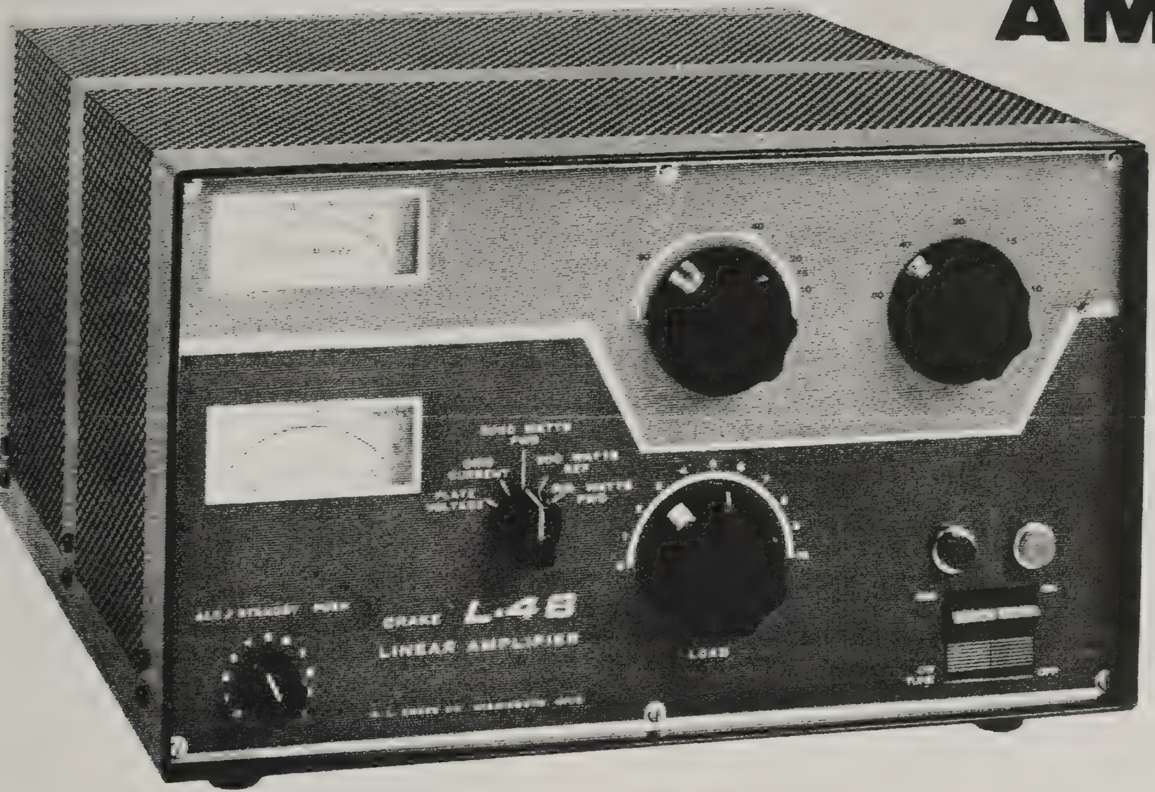


BLOCK DIAGRAM FOR
T-4X
TRANSMITTER

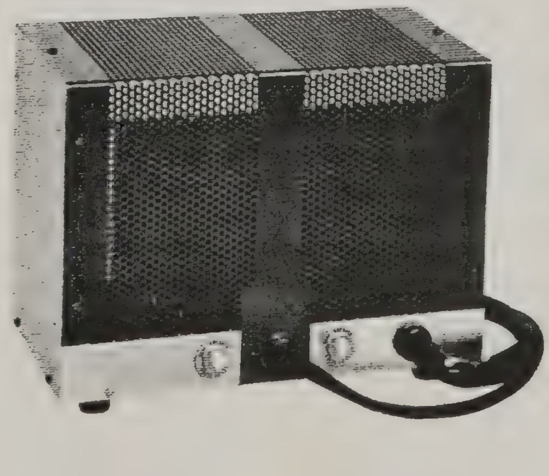
R. L. DRAKE CO., MIAMISBURG, OHIO

MODEL L-4B

LINEAR AMPLIFIER



- **2000 watts PEP SSB — 1000 watts DC input power on CW, AM, and RTTY.** Massive plate transformer, large heavy duty plate tank components and voluminous cooling system insure continuous operation at these ratings.
- **High-efficiency Class B Grounded Grid Circuit** uses the new Eimac 3-500Z zero bias triodes. These tubes have a total plate dissipation rating of 1000 watts and their rugged construction withstands abuse.
- **A broadband tuned input circuit** is employed on each band for minimum distortion, higher efficiency and a 50 ohm input impedance.
- **Vernier Drive** on the plate tuning control for easy plate tuning.
- **New Epoxy Finish** and eye-ease front panel.
- **The L-4B matches the TR-4 Transceiver and the T-4/T-4X/T-4XB Transmitters in appearance** and drive requirements to run the maximum legal input power. Any exciter that can deliver 100 watts PEP SSB and 75 watts on CW will be able to drive the L4B to the maximum legal input power. An advantage of the grounded grid circuit is that most of the driving power adds to the output power.
- **Two Taut-band suspension meters** indicate plate current, grid current, plate voltage, forward and reflected R.F. power. The plate current meter time constant is consistant with FCC regulations.
- **A transmitting AGC circuit** controls the exciter gain to allow the highest average power without peak clipping. A front panel adjustment is provided to set the threshold level for optimum operation of different exciters.
- **A Standby Switch** on the L4B allows the L4B to remain "On" while operating with the exciter only.
- **RF Negative Feedback** decreases distortion to better than 35 dB and tends to equalize tube characteristics from tube to tube and from brand to brand.
- **Built-in RF directional wattmeter** calibrated 300 and 3000 watts forward and 300 watts reflected.
- **An internal changeover relay** feeds the antenna through when on "Receive", "Standby", or when power is off. A pair of relay contacts bias the output tubes to cutoff, eliminating unwanted heat and diode noise when receiving.
- **A Quiet, Internal Blower** - low velocity, high volume. Effectively cools tube base seals, envelopes, and plate seals.
- **The Solid State Power Supply** provides excellent dynamic and static voltage regulation. The power supply is separate to keep the weight off the operating desk and to make a more flexible installation.



Model L-4B includes Power Supply Model L-4PS, Tubes and Chimneys

MODEL L-4B

FREQUENCY COVERAGE – Ham bands 80 through 10 meters. All frequencies 3.5 to 30 MHz may be covered with alteration of input coils.

PLATE INPUT – 2000 watts PEP – SSB, 1000 watts DC on CW, AM and RTTY.

DRIVE REQUIREMENTS – 100 watts PEP – SSB, 75 watts CW, AM and RTTY.

INPUT IMPEDANCE – 50 ohms.

OUTPUT IMPEDANCE – Adjustable pi-network matches 50 ohm line with SWR not to exceed 2:1.

WATTMETER ACCURACY – 300 watts forward and reflected, ± (5% of reading + 3 watts). 3000 watts forward, ± (5% of reading + 30 watts).

POWER REQUIREMENTS – 230 volts 50 – 60 cycles 15 amperes, or 115 volts 50 – 60 cycles 30 amperes.

DIMENSIONS – Amplifier 13–15/16"W x 7–7/8"H x 14–5/16"D;
Power supply 6–3/4"W x 7–7/8"H x 11"D.

WEIGHT – Amplifier 32 lbs; Power Supply 43 lbs.

TUBE COMPLEMENT – Two 3-500Z (Two 8163 or Two 3-400Z can be used)

SHIPPING:		Amplifier	Power Supply
	Weight	42 lbs.	48 lbs.
	Dimensions	21 x 12 x 17"	11½ x 11 x 13½"

FRONT PANEL CONTROLS

ON-OFF – Rocker Switch

SSB-CW/TUNE – Rocker switch changes plate voltage for different modes of operation.

BAND – Switch selects desired ham bands (See Frequency Coverage).

PLATE AND LOAD – Tuning adjust pi-network capacitors in tank circuit for proper resonance and loading on all bands.

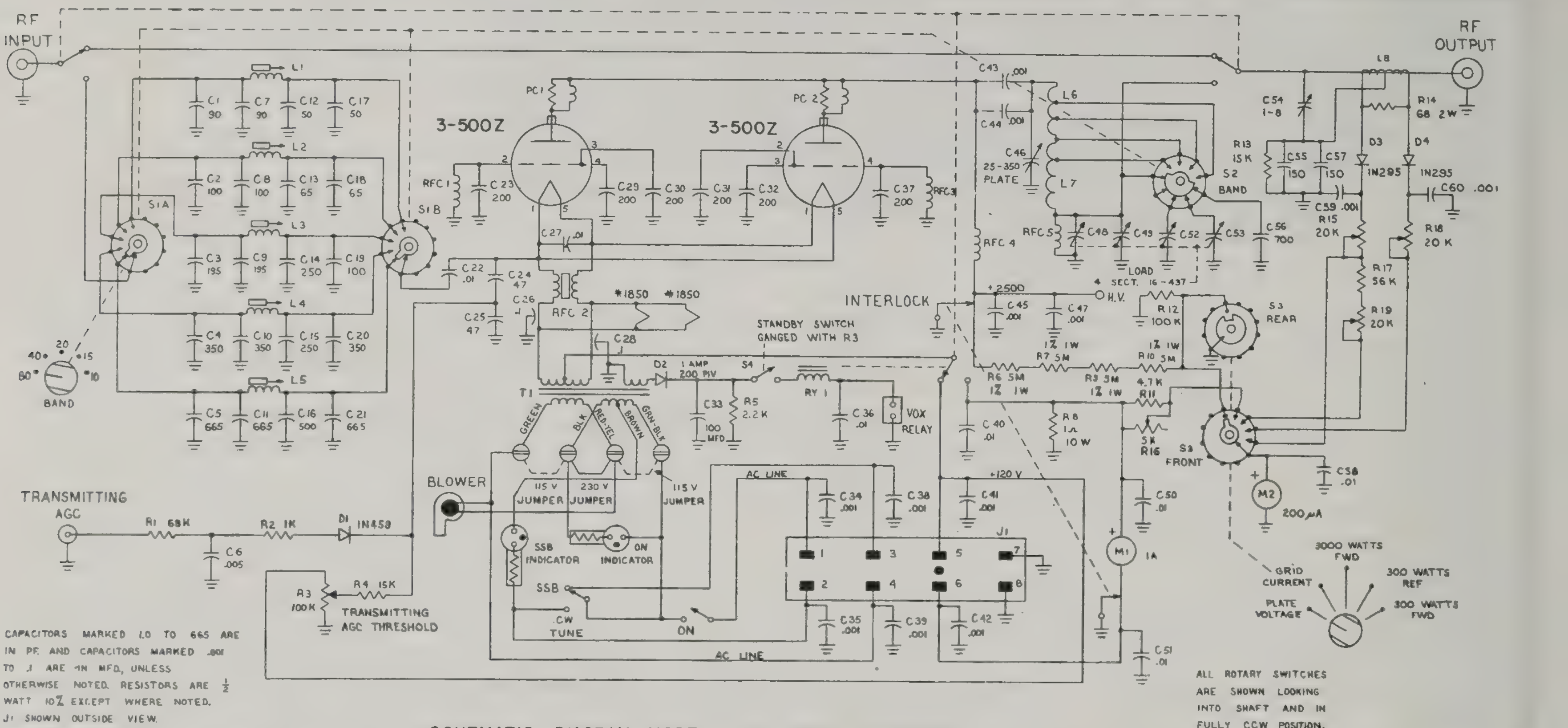
METER – Switch selects monitoring either grid current, plate voltage, forward or reflected RF power on the lower meter.

ALC/STANDBY PUSH – Transmitting AGC threshold adjustment and push-pull switch that allows the L-4B to remain on while operating with the exciter only.

REAR JACKS – Power (connects L-4B to power supply), high voltage, VOX (for turning on L-4B with exciter VOX contacts), transmitting AGC (for connecting transmitting AGC to exciter), RF input (for connecting to exciter RF output), RF output (for connecting L-4B to an antenna).

METERS – Plate Current, Grid Current/Plate Voltage/Forward Power/Reflected Power (switch selected).

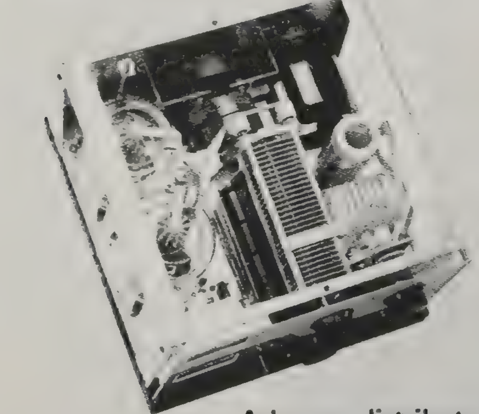
POWER SUPPLY CONTROLS – Two circuit breaker reset buttons.



SCHEMATIC DIAGRAM MODEL L-4B LINEAR AMPLIFIER

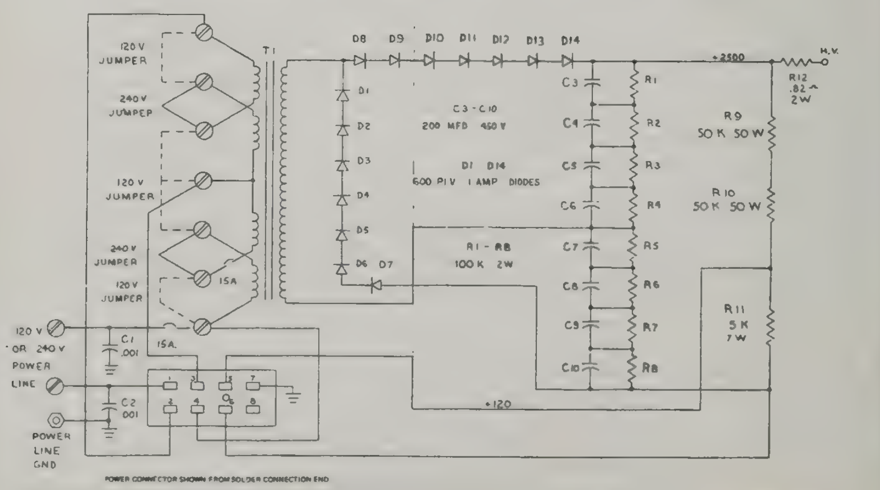
CAPACITORS MARKED 10 TO 665 ARE IN PF. AND CAPACITORS MARKED .001 TO .1 ARE IN MFD, UNLESS OTHERWISE NOTED. RESISTORS ARE ½ WATT 10% EXCEPT WHERE NOTED.
J1 SHOWN OUTSIDE VIEW.
HIGHEST RESISTOR R19
HIGHEST CAPACITOR C60

42268801



Model L-4B with cover removed.

Schematic Diagram L-4PS Power Supply



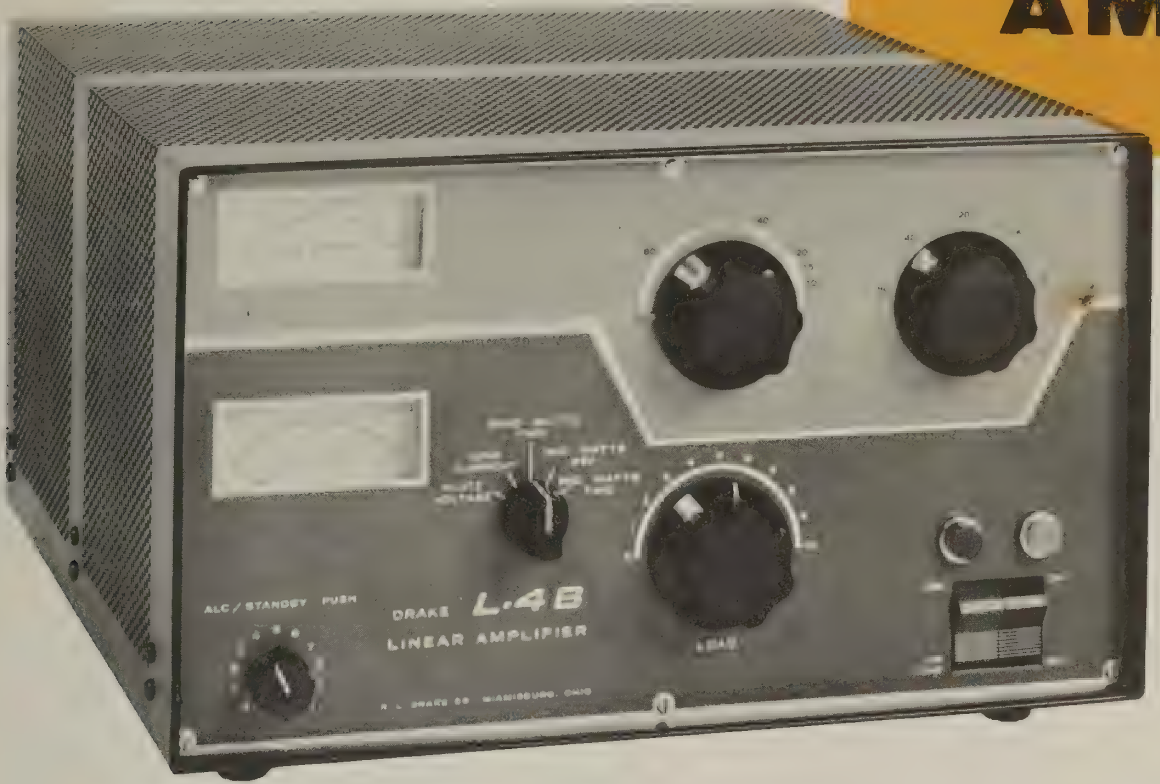
Ask your distributor
about other Drake products, or write:

R. L. DRAKE COMPANY
540 Richard Street, Miamisburg, Ohio 45342

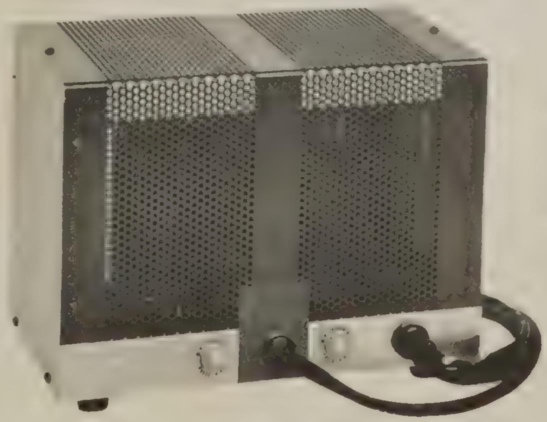
R. L. DRAKE

MODEL L-4B

LINEAR AMPLIFIER



- **2000 watts PEP SSB — 1000 watts DC input power on CW, AM, and RTTY.** Massive plate transformer, large heavy duty plate tank components and voluminous cooling system insure continuous operation at these ratings.
- **High-efficiency Class B Grounded Grid Circuit** uses the new Eimac 3-500Z zero bias triodes. These tubes have a total plate dissipation rating of 1000 watts and their rugged construction withstands abuse.
- **A broadband tuned input circuit** is employed on each band for minimum distortion, higher efficiency and a 50 ohm input impedance.
- **Vernier Drive** on the plate tuning control for easy plate tuning.
- **New Epoxy Finish** and eye-ease front panel.
- **The L-4B matches the TR-4 Transceiver and the T-4/T-4X/T-4XB Transmitters in appearance** and drive requirements to run the maximum legal input power. Any exciter that can deliver 100 watts PEP SSB and 75 watts on CW will be able to drive the L4B to the maximum legal input power. An advantage of the grounded grid circuit is that most of the driving power adds to the output power.
- **Two Taut-band suspension meters** indicate plate current, grid current, plate voltage, forward and reflected R.F. power. The plate current meter time constant is consistant with FCC regulations.
- **A transmitting AGC circuit** controls the exciter gain to allow the highest average power without peak clipping. A front panel adjustment is provided to set the threshold level for optimum operation of different exciters.
- **A Standby Switch** on the L4B allows the L4B to remain "On" while operating with the exciter only.
- **RF Negative Feedback** decreases distortion to better than 35 dB and tends to equalize tube characteristics from tube to tube and from brand to brand.
- **Built-in RF directional wattmeter** calibrated 300 and 3000 watts forward and 300 watts reflected.
- **An internal changeover relay** feeds the antenna through when on "Receive", "Standby", or when power is off. A pair of relay contacts bias the output tubes to cutoff, eliminating unwanted heat and diode noise when receiving.
- **A Quiet, Internal Blower** - low velocity, high volume. Effectively cools tube base seals, envelopes, and plate seals.
- **The Solid State Power Supply** provides excellent dynamic and static voltage regulation. The power supply is separate to keep the weight off the operating desk and to make a more flexible installation.



Model L-4B
includes
Power Supply
Model L-4PS,
Tubes and
Chimneys

MODEL **L-4B** SPECIFICATIONS

FREQUENCY COVERAGE – Ham bands 80 through 10 meters. All frequencies 3.5 to 30 MHz may be covered with alteration of input coils.

PLATE INPUT – 2000 watts PEP – SSB, 1000 watts DC on CW, AM and RTTY.

DRIVE REQUIREMENTS – 100 watts PEP – SSB, 75 watts CW, AM and RTTY.

INPUT IMPEDANCE – 50 ohms.

OUTPUT IMPEDANCE – Adjustable pi-network matches 50 ohm line with SWR not to exceed 2:1.

WATTMETER ACCURACY – 300 watts forward and reflected, ± (5% of reading + 3 watts). 3000 watts forward, ± (5% of reading + 30 watts).

POWER REQUIREMENTS – 230 volts 50 – 60 cycles 15 amperes, or 115 volts 50 – 60 cycles 30 amperes.

DIMENSIONS – Amplifier 13–15/16"W x 7–7/8"H x 14–5/16"D;
Power supply 6–3/4"W x 7–7/8"H x 11"D.

WEIGHT – Amplifier 32 lbs; Power Supply 43 lbs.

TUBE COMPLEMENT – Two 3-500Z (Two 8163 or Two 3-400Z can be used)

SHIPPING:		Amplifier	Power Supply
	Weight	Amplifier 42 lbs.	Power Supply 48 lbs.
	Dimensions	21 x 12 x 17"	11½ x 11 x 13½"

FRONT PANEL CONTROLS

ON-OFF – Rocker Switch

SSB-CW/TUNE – Rocker switch changes plate voltage for different modes of operation.

BAND – Switch selects desired ham bands (See Frequency Coverage).

PLATE AND LOAD – Tuning adjust pi-network capacitors in tank circuit for proper resonance and loading on all bands.

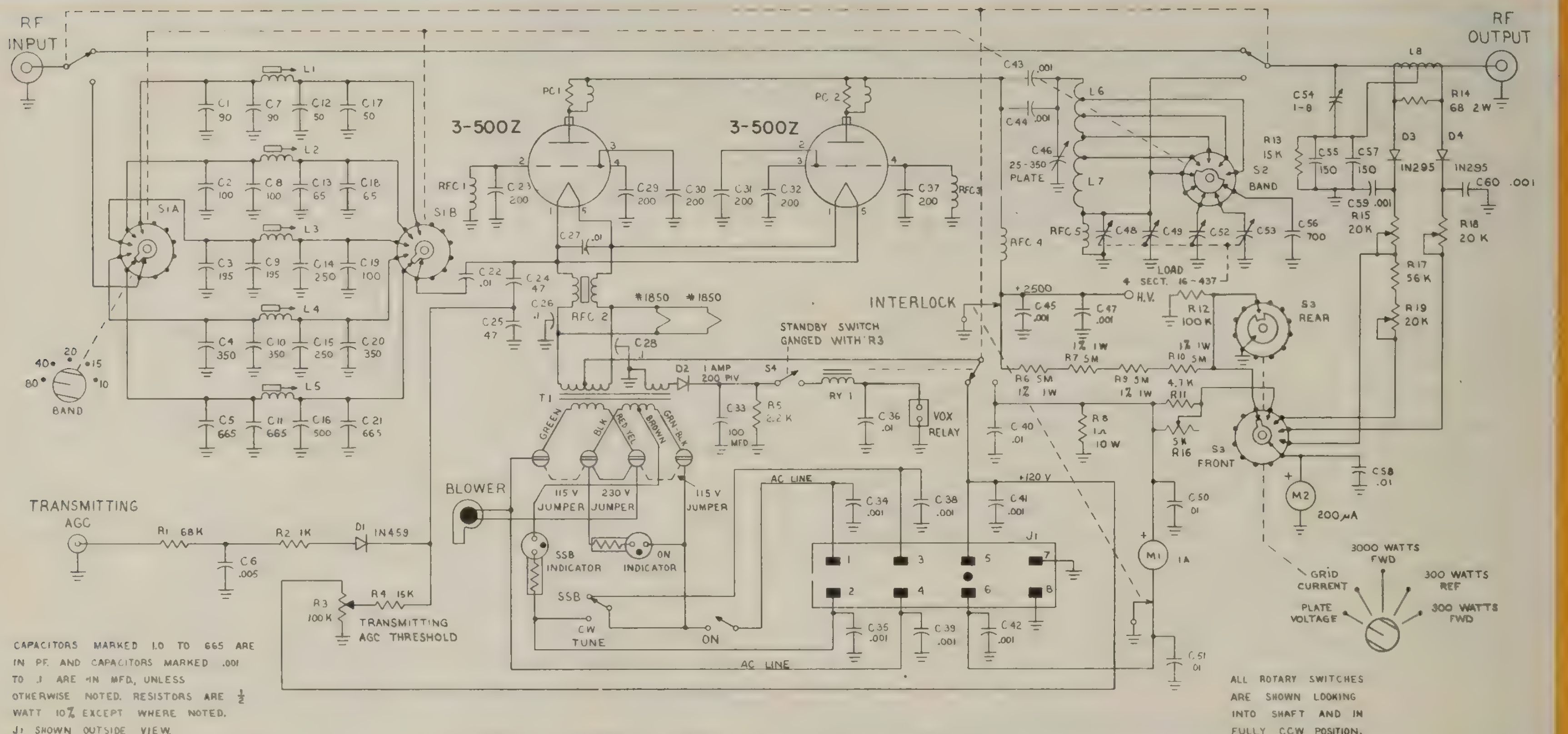
METER – Switch selects monitoring either grid current, plate voltage, forward or reflected RF power on the lower meter.

ALC/STANDBY PUSH – Transmitting AGC threshold adjustment and push-pull switch that allows the L-4B to remain on while operating with the exciter only.

REAR JACKS – Power (connects L-4B to power supply), high voltage, VOX (for turning on L-4B with exciter VOX contacts), transmitting AGC (for connecting transmitting AGC to exciter), RF input (for connecting to exciter RF output), RF output (for connecting L-4B to an antenna).

METERS – Plate Current, Grid Current/Plate Voltage/Forward Power/Reflected Power (switch selected).

POWER SUPPLY CONTROLS – Two circuit breaker reset buttons.



CAPACITORS MARKED 1.0 TO 665 ARE IN PF. AND CAPACITORS MARKED .001 TO .1 ARE IN MFD, UNLESS OTHERWISE NOTED. RESISTORS ARE ½ WATT 10% EXCEPT WHERE NOTED.
J1 SHOWN OUTSIDE VIEW.
HIGHEST RESISTOR R19
HIGHEST CAPACITOR C60

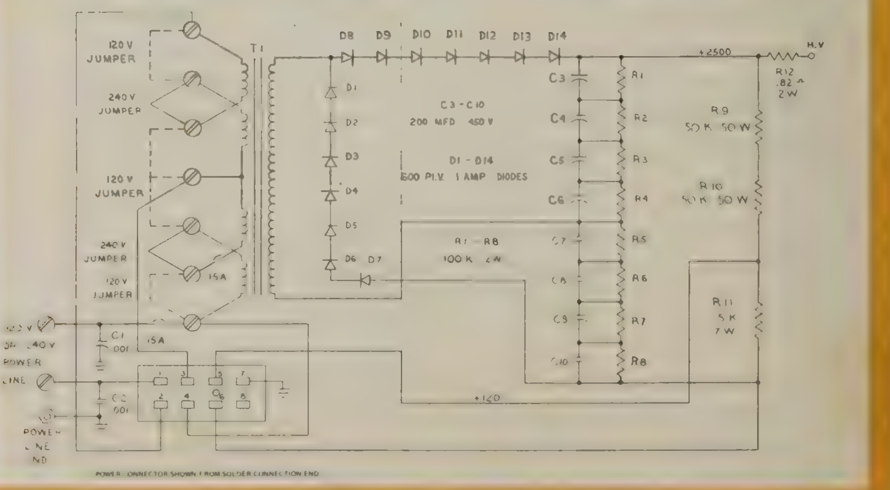
42268801

SCHEMATIC DIAGRAM MODEL L-4B LINEAR AMPLIFIER

ALL ROTARY SWITCHES ARE SHOWN LOOKING INTO SHAFT AND IN FULLY CCW POSITION.

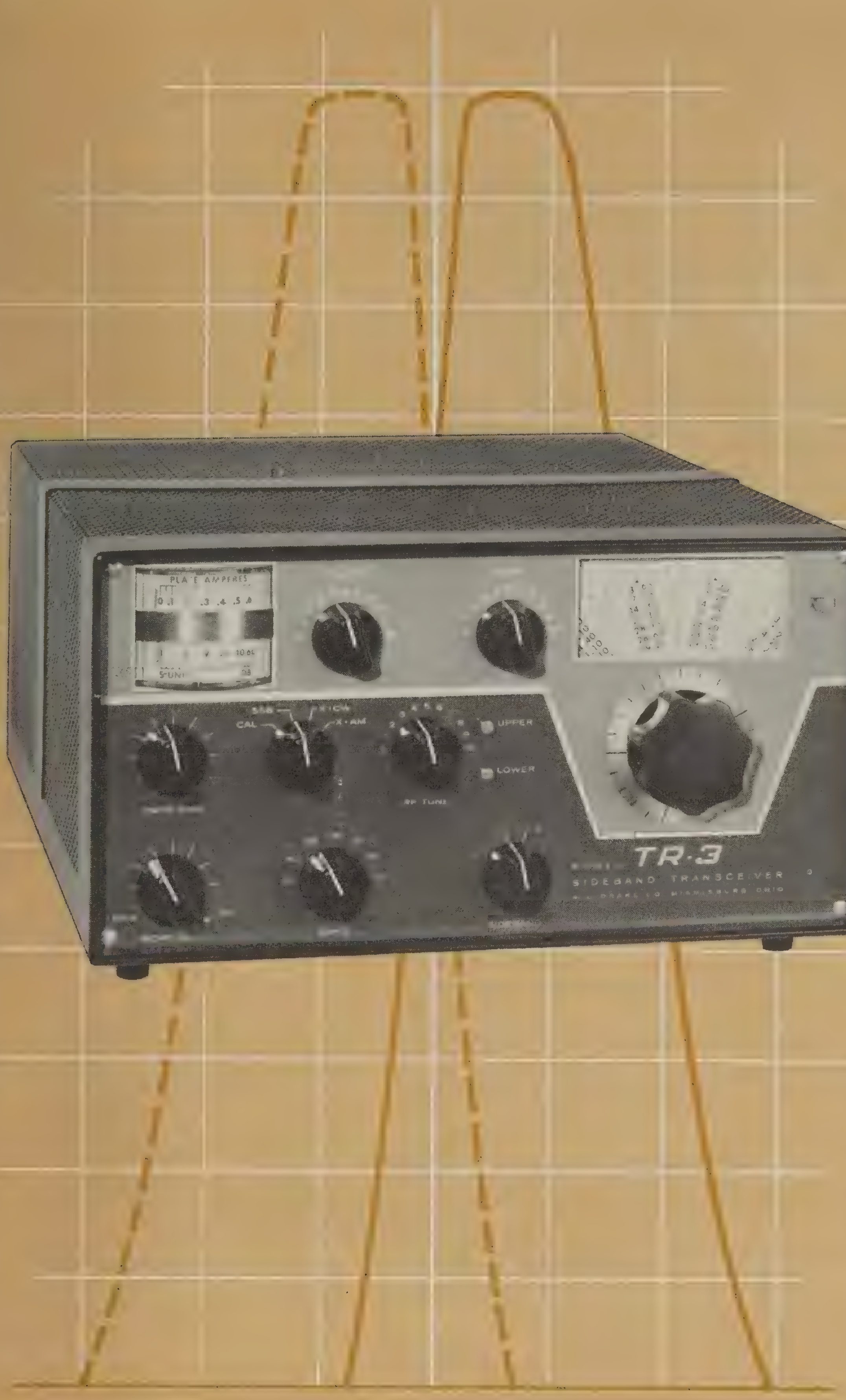
Model L-4B with cover removed.

Schematic Diagram L-4PS Power Supply



Ask your distributor
about other Drake products, or write:

R. L. DRAKE COMPANY
540 Richard Street, Miamisburg, Ohio 45342



R. L. DRAKE • MODEL

TR-3

SIDEBAND TRANSCEIVER

The TR-3 is another Drake design bringing the radio amateur "more performance at less cost, through engineering."

The TR-3 is engineered for optimum performance on upper or lower sideband, with AM and CW included for the "ham" who likes variation, or who desires to contact stations limited to these modes.

Compact and lightweight, it is ideal for limited space, for mobile, for vacations, and for portable excursions. With 300 watts P.E.P. input it will give a good account "barefoot" and will drive high power "ham" linears. The accessory RV-3 Receiving VFO solves the problem of working DX and stations operating on frequencies other than your transmitting frequency.

FEATURES:

FULL FREQUENCY COVERAGE all amateur bands 10 through 80 meters

UPPER and LOWER SIDEBAND on all bands

VOX or PTT

OUTPUT IMPEDANCE ADJUSTABLE with pi-network

300 WATTS P.E.P. on SSB

CONTROLLED CARRIER SCREEN MODULATOR for AM built-in

SHIFTED CARRIER CW, 260 watts input

TWO SPECIAL 9 Mc CRYSTAL FILTERS for sideband selection

LINEAR PERMEABILITY TUNED VFO

SEPARATE RF and AF GAIN CONTROLS

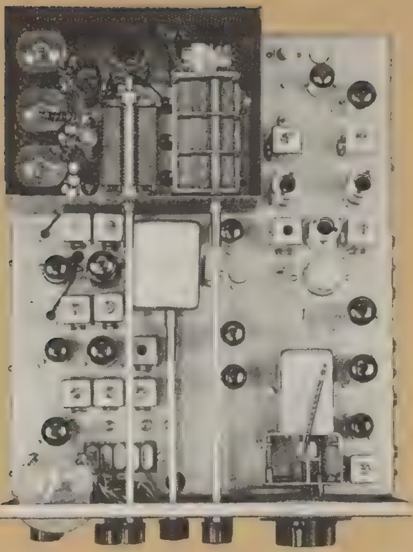
FULL AGC with Drake dual time constant system

2.1 KC PASSBAND

100 KC CRYSTAL CALIBRATOR built-in

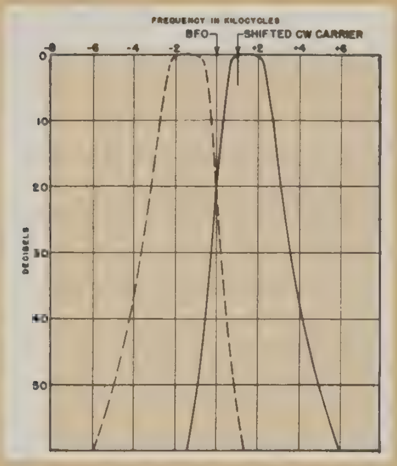
SEPARATE RECEIVER S-METER and **TRANSMITTER PLATE AMMETER**

ONLY ONE DPDT RELAY USED — RF switching limited to antenna

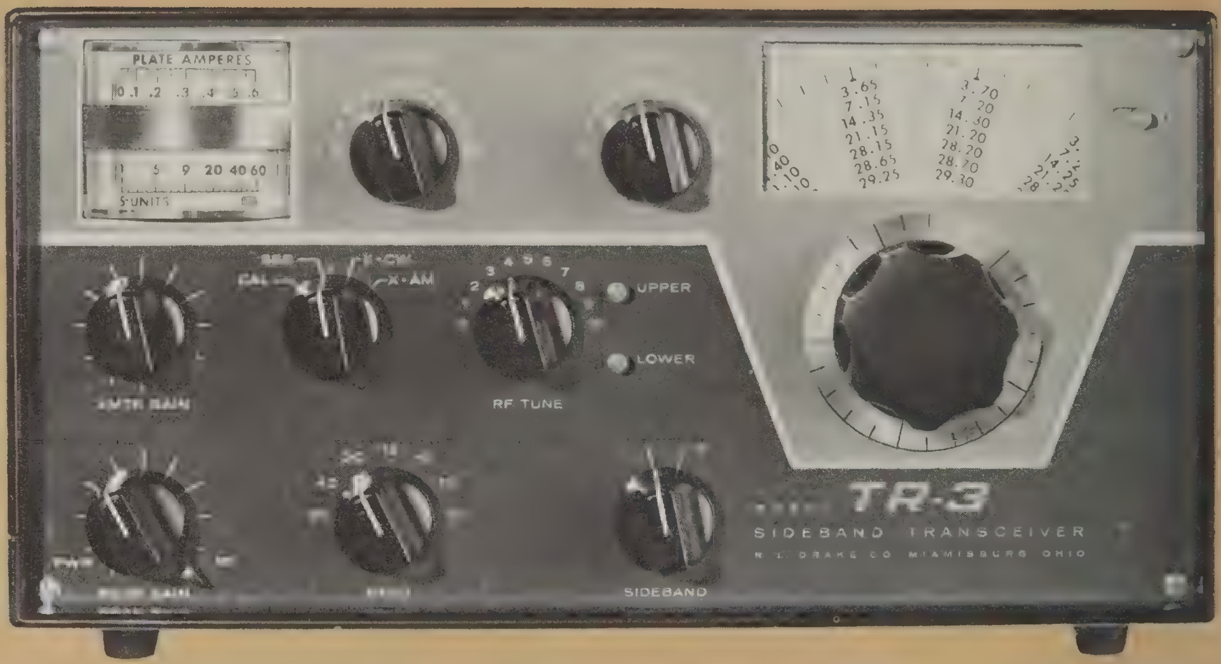


Top view, TR-3 with cover removed.

DRAKE MODEL TR-3

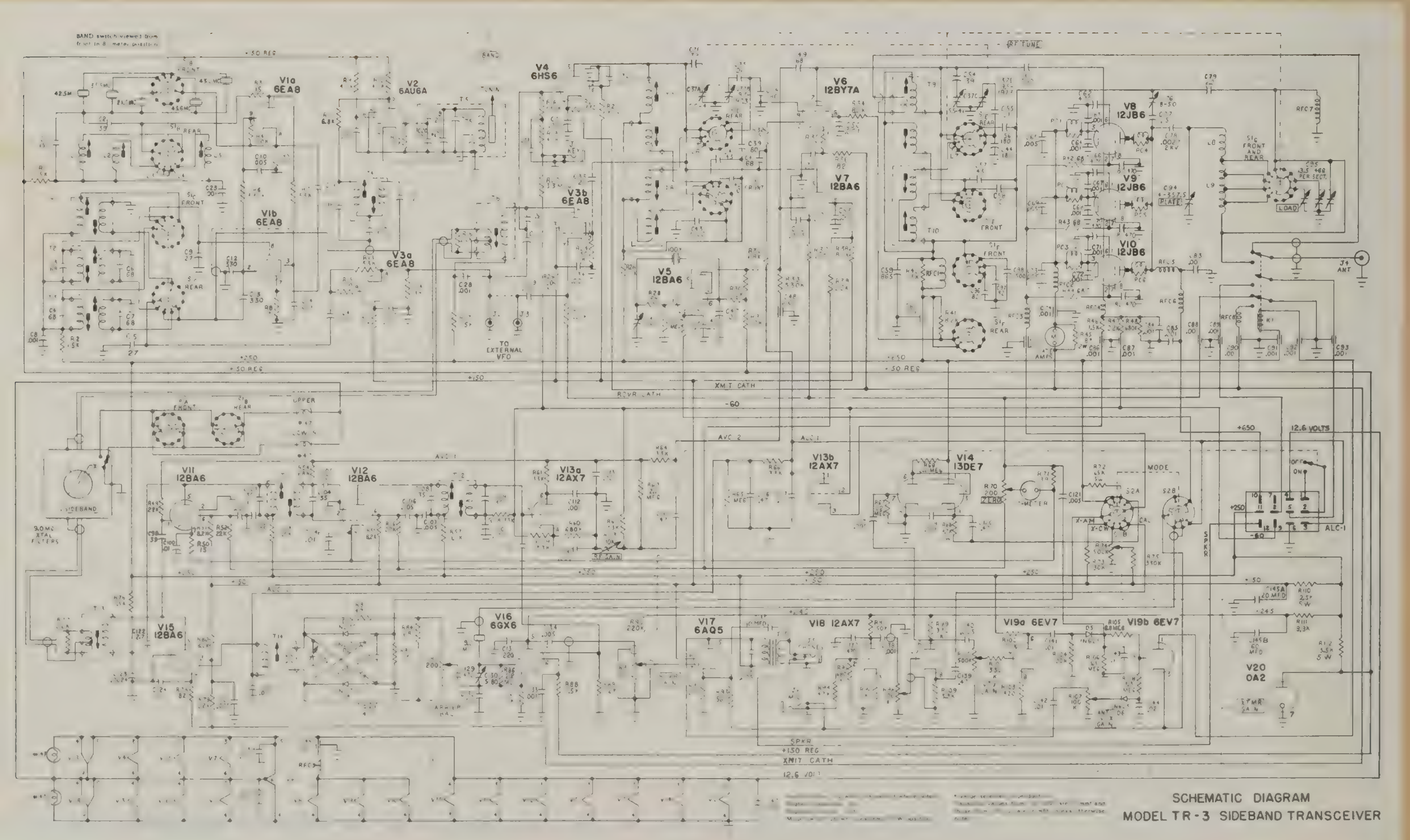


Selectivity curve, 9 Mc Crystal Filters.



$550.00

AMATEUR NET



SCHEMATIC DIAGRAM
MODEL TR-3 SIDEBAND TRANSCEIVER

SIDEBAND TRANSCEIVER

GENERAL SPECIFICATIONS:

FREQUENCY COVERAGE: Full coverage on all amateur bands 10 thru 80 meters, in seven 600 kc ranges: 3.5 to 4.1 mc, 7.0 to 7.6 mc, 13.9 to 14.5 mc, 21 to 21.6 mc, 28 to 28.6 mc, 28.5 to 29.1 mc, 29.1 to 29.7 mc.

LINEAR PERMEABILITY TUNED VFO tunes 4.9 to 5.5 mc for all ranges. 9 mc I. F. minus VFO range covers 80 meters, 9 mc I. F. plus VFO range covers 20 meters. VFO and crystal oscillator heterodyned in premixer for 40, 15, and three 10 meter ranges.

DIAL CALIBRATION: 10 kc divisions on main tuning dial and interpolation to 1 kc on tuning knob skirt. Effective length of circular dial scale is over 14 inches.

FREQUENCY STABILITY: High stability permeability tuned VFO tunes same range on all bands. Drift is less than 100 cycles after warm-up, and less than 100 cycles for plus or minus 10% line voltage change.

MODES OF OPERATION: SSB Upper and Lower Sideband, CW and AM.

FRONT PANEL CONTROLS:

"Main Tuning" has fluted knob with adjustable 25 division skirt. Tunes VFO and rotates main dial.

"RF Tune" tunes the RF circuits common to receiver RF amplifier and transmitter driver stages. 0-10 scale.

"Plate and **"Load"** tuning adjust pi-network capacitors in transmitter for proper resonance and loading on each band.

"Band" switch selects desired ham band (see frequency coverage).

"Function" switch has four positions "CAL, SSB, X-CW, X-AM." "CAL" operates built-in 100 kc crystal calibrator for accurate setting of main tuning hair line indicator and knob skirt. "SSB" provides SSB operation, either VOX or PTT, and is receive position for SSB, CW and AM. "X-CW" (transmit CW) inserts carrier, converts 'Xmtr Gain' control to carrier injection for tuning and CW transmitting. "X-AM" (transmit AM) inserts carrier and screen modulator for AM transmitting.

"XMTR GAIN" functions as mike audio gain on SSB and AM, and as carrier injection control on X-CW for tune and CW.

"RCVR Gain" knob controls receiver AF gain and power ON-OFF switch. Lever behind knob controls setting of RF gain.

"Sideband" switch in conjunction with indicator lights marked **"Upper"** and **"Lower"** selects desired sideband by connecting into the circuit either the upper or lower sideband filter.

RIGHT SIDE SCREWDRIVER ADJUST CONTROLS: Vox Gain, Anti-Vox Gain, S-Meter Zero.

INSIDE SCREWDRIVER ADJUST CONTROLS: Carrier Balance.

RIGHT SIDE JACKS: Headphone (disconnects speaker circuit), Microphone (3-circuit for PTT), Key (normally closed).

METERS: Separate receiver S-meter and transmitter plate ammeter.

MISC: 20 tubes including voltage regulator; 6 diodes; 100 kc crystal calibrator built-in. Dimensions: 5½" high, 10¾" wide, 14⅜" deep. Weight: 15½ lbs.

TUBE Complement	FUNCTION Transmitter	Receiver
12AX7	Mike Amp.	—
6EV7	Vox Amp./Relay	—
6GX6	9 MC Xtal Osc.	BFO/Prod. Det.
12BA6	I. F. Amp.	—
12BA6	—	I. F. Amp.
12BA6	—	I. F. Amp.
12AX7	AGC	AGC
6AQ5A	Anti-Vox	Audio Output
6HS6	Mixer	—
6EA8	Cathode Fol.	Mixer/Cath. Fol.
6EA8	Pre-Mixer/Xtal Osc.	Pre-Mixer/Xtal Osc.
6AU6A	VFO	VFO
13DE7	AM Screen Mod.	—
12BA6	—	R. F. Amp.
12BA6	—	Crystal Calib.
12BY7A	Driver	—
(3) 12JB6	Power Amps	—
OA2	Voltage Reg.	Voltage Reg.

TRANSMITTER SPECIFICATIONS:

SINGLE SIDEBAND: 300 watts P.E.P. input power. VOX or PTT. Two special 9 mc crystal filters provide sideband selection, upper or lower on any band, without the necessity of shifting any oscillators. The 9 mc filters are asymmetrical, that is, steeper on the carrier side (see filter selectivity charts) making possible unwanted sideband suppression of more than 40 db and carrier suppression of 50 db. Overall audio frequency response 400 to 2500 cycles at 6 db down. Distortion products 30 db down at maximum output.

CW: Power input 260 watts. Carrier is shifted approx. 1000 cycles into one sideband and mixer is keyed. Grid block keying is free from chirps and clicks. Manual transmit/receive switching.

AM: Controlled carrier AM screen modulator is built-in. 260 watts P.E.P. input. Low carrier power increases 6 times to 50 watts output at maximum modulation. This system is compatible with SSB linears. Manual transmit/receive switching.

OUTPUT IMPEDANCE: Nominal 50 ohms, adjustable with pi-network.

MICROPHONE INPUT: High-impedance.

RECEIVER SPECIFICATIONS:

SENSITIVITY: Less than ½ microvolt for 10 db S/N.

I. F. SELECTIVITY: 2.1 kc at 6 db, 7.5 kc at 60 db.

AGC: FULL AGC on received modes—audio ouput varies less than 3 db for 60 db change in signal level. Any amount of AGC from zero to full can be had by adjustment of RF gain control. Time proven Drake AGC system provides fast attack and slow release with noise pulse suppression, no pumping or popping evident.

AM: Product detector reception of AM (known as exalted carrier method) requires zero beating signal. Advantages over diode detectors include no selective fading, choice of either sideband, and better audio frequency response at 2.1 KC selectivity, resulting in more QRM free QSO's.

ANTENNA INPUT: Nominal 50 ohms.

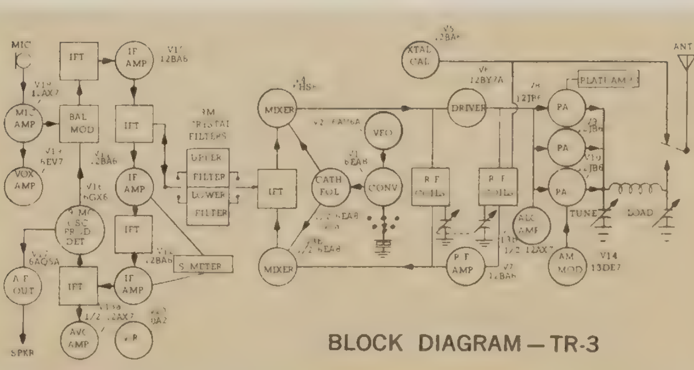
AUDIO RESPONSE: 400 to 2500 cycles at 6 db.

AUDIO OUTPUT POWER: 2 watts.

AUDIO OUTPUT IMPEDANCE: 4 ohms.

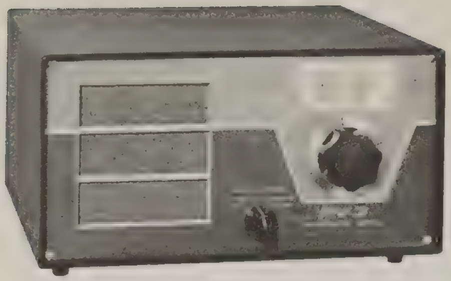
POWER SUPPLY REQUIREMENTS: Due to the 300 watt P.E.P. input rating, the TR-3 will require a power supply capable of low voltage at high current with very good dynamic regulation. The voltage and current requirements are as follows:

1. 650 volts at 300 ma average and 500 ma maximum with 10% regulation from 100 ma to 500 ma and maximum ripple of less than 1%.
2. 250 volts at 175 ma with 10% regulation from 150 ma to 180 ma. This includes the effect of the 650 volt supply change if both voltages are obtained from the same transformer. Maximum ripple must be less than ¼%.
3. —45 to —65 VDC adjustable filtered bias into 33K ohm load.
4. 12.6 Volt AC or DC at 5.5 amps.



BLOCK DIAGRAM—TR-3

TR-3 ACCESSORIES



REMOTE VFO

Model RV-3 . . . $79.95

Consists of same VFO and calibrated dial as TR-3, cathode follower, voltage regulator, and required control circuitry to permit reception, transmission, or transceiver operation on a separate frequency in the same band to which the TR-3 is tuned. All these functions performed without retuning TR-3 VFO. Includes 5-inch speaker, 3-foot interconnecting cable, and space for AC Power Supply.

Dim.: 5⅜"h, 10¾"w, 11⅛"d.
Weight 8½ lbs.

MATCHING SPEAKER

Model MS-3 . . . $19.95

Contains a 5 x 7 inch heavy magnet speaker and connecting cable. Styled to match TR-3 Transceiver. Space for mounting AC power supply in rear.

Dim.: 5⅜" h, 10¾" w, 11⅛" d.
Weight: 6 lbs.

MOBILE MOUNTING KIT Model MMK-3 $6.95

Contains brackets and hardware for under-dash or hump mounting TR-3 in practically all cars. Weight 1 lb.

POWER SUPPLIES

AC Power Supply Model AC-3 $79.95

Designed to supply all voltage and current requirements for the TR-3. Seven silicon diode rectifiers. 120 volt 50/60 cycle. Has 5 ft. interconnecting cable with 12-prong connector and speaker connector. Will mount in rear of MS-3 and RV-3 cabinets.

Dimensions: 5" x 5" x 10¼".
Weight: 15 lbs.

DC Power Supply Model DC-3 $129.95

Transistorized. Operates from 12 VDC. Supplies all voltage and current requirements for the TR-3. Has 5 ft. interconnecting cable and speaker connector.

Dimensions: 3⅜"h, 4⅜"w, 8"d.
Weight: 7½ lbs.

7" x 12" x 9"

OTHER DRAKE PRODUCTS

2-B Receiver...$279.95

2-B ACCESSORIES

2-BQ Q-Multiplier/Speaker . . .	$39.95
2-BS Matching Speaker	16.95
2-AC 100 Kc Crystal Calibrator	16.95
Accessory Crystals . . . . . each	5.00

TVI Filters

TV-300-HP High Pass Filter . .	$ 3.97
TV-1000-LP Low Pass Filter . .	16.95
TV-100-LP Low Pass Filter . . .	5.95
TV-CB-LP Citizen Band Low Pass	6.95
TV-300-FMT FM Band Rejection	2.55

All prices are amateur net.
See your distributor or write for further information.

R. L. DRAKE COMPANY · MIAMISBURG, OHIO, 45342

TR-3
Operating and Instruction
MANUAL
Price $2.00
Postpaid in U.S.A.

Drake Mods - TR4 Transceivers

Authored by VE3EFJ

9.0 TR4ANY TRANSCEIVERS

The TR4 series represent possibly the BEST vaccuum tube transceivers ever made. The transceiver will easily put out 200 watts on 80 meters and 100 watts on 10. For comparison purposes, the unit is somewhat SB100 series like, but the TR4 receiver is much more sensitive on 15 and 10. Unlike the Heathkit, a noise blanker could be installed. It was only the very last TR4 that had an RIT circuit. The TR4Cany had a plug in relay; on the TR4, the relay was open frame and hard wired.

All TR4 have a 9 MHz IF that is incompatible with other C line. They will not transceive with an R4any, but they will mute and T/R switch the antenna line. Because a 9 MHz IF and a 5 MHz VFO is used, 20 meters is generated 'free' but tunes backwards as a consequence. If you suspect the crystal oscillator having a fault, check for output on 20 or 80.

The TR4 had full 10 meter coverage; on the TR4Cany only 28.5 was included - the other 2 band crystals were options.

There were 4 different series of transceivers that I am aware of:

- TR4 (circa 1970)
  The basic transceiver. No RIT or CW filter. There were 2 models of this first transceiver. An 'early' model and a 'later' one. The early model was a transitional model from the TR3.

  The AGC characteristics in the TR4 seem different than other transceivers in the 4 line, but the differences are subtle. After this model, Drake made some subtle changes in the AGC amplifier, V13. Full 10 meter coverage.
- TR4C
  The basic C transceiver. No RIT or CW filter. Dual dial plates. Some minor changes in the tube line up and 1 pf caps on the IF transformers to get some more gain. The audio output stage in this and subsequent models employed negative feedback. Basically a plain TR4 with C line PTO.
- TR4Cw
  Some subtle internal changes. Dual dial plates. Has a 500 Hz CW filter. No RIT. Basically a TR4C with a 500 Hz CW filter
- TR4Cw-RIT
  The final model, sold for a period of time against the TR7. This model had it all - CW filter and RIT. It is distinguished by having the RIT control positioned in the lower right hand corner where the NB switch resided and having 2 pushbuttons in the lower center of the front panel for activation of the NB and the RIT.

  The TR7 uses a very similar RIT circuit.

Over the years, the TR4 didn't change all that much. All models are noted for high TX output, sensitive receivers and for running hot. You need a fan.

Most of the TR4any I see do not have the noise blanker. Pity. The 34PNB works very well. Typical for a transceiver of that era, there is no selectivity available other than the SSB crystal filter (or the CW filter, depending upon model). Just about any flavor of a TR4 will serve you well on sideband, but to get the RIT function, you need to purchase a TR4Cw-RIT or have a remote VFO. In this day and age, RIT is not as important as it was, for the people you are most likely to work will be more stable than you are. It is *they* that will be using RIT. The DC3 or DC4 will allow the TR3 or TR4 to go mobile, but the radio is just too big for most modern cars. There is no reason why you cannot operate one mobile, but

Radiomania® Books ANTIQUE RADIO PRICE GUIDES

DRAKE R.L. DRAKE VIRTUAL MUSEUM
by: JM CHERRY
& Sindre TORP

Radiomania® Books ANTIQUE RADIO PRICE GUIDES

◀ Previous ■ Home ▲ Up ▶ Next

Drake Mods -T4- Series TR-ansmitters
Authored by VE3EFJ
7.0 TR-3 TR-ANSCEIVER (CIRCA 1963)

This Transceiver is best described as a 'sleeper'. It is a 5 band SSB Transceiver that predated the TR-4, placing it in the mid 60's. Most of the units available are pretty weather beaten, but I have seen one or two that were in beautiful shape. All of them are relatively inexpensive. If you want a nice, inexpensive glass FET transceiver, a TR-3 is hard to beat. They work as well as a TR-4 and look very much like one. I doubt if you'd mistake the two, but if you did, little harm would be done. The TR-3 has styling similar to a T4-X, the precursor to the T4-B.

As is not unusual for the Drake transceivers, most of what is mentioned for the TR-4 is applicable for the TR-3.

Make sure you get the manual with the radio!

Basic differences to the TR-4:

- 12JB6 tubes in the PA (3)
- Vacuum tube PTO
- No rel output indication
- No CW sidetone
- No CW filter
- IF Filtering not as sharp as the TR-4
- No provision for a blanker
- No external mute or RX antenna relay

If all you wanted was a TR-4 to play reTR-o radio with, a good clean TR-3 would do almost as well and can be had for a song. Be careful in this area. Radios this old will suffer from use, and pay careful attention to the switches, controls and the operation of the two meters.

◀ Previous ■ Home ▲ Up ▶ Next

Layout, presentation, scanning of text and pictures : (c)1998-2002 D. PRODUCTS SA/NV - SOFTWARE DEPARTMENT
No publication without written permission of JM CHERRY DRAKE is a registered trade mark of R.L. DRAKE Company

Last update: 30 nov. 2002 01:31

DRAKE

CRYSTAL ORDER FORM

Fixed Frequency Operation with:

T–4
T–4B
T–4X*
T–4XB*
T–4XC
R–4A
R–4B

For operation below 10 MHz, Xtal Freq. = Oper. Freq. + 5.645.

For operation above 10 MHz, Xtal Freq. $= \frac{\text{Oper. Freq.} + 5.645}{2}$

*Modified for fixed frequency operation

UNIT PRICE: $7.85

Fixed Frequency Operation with:

R–4 Xtal Freq. = Oper. Freq. + 11.1. A 5.455 MHz lock Xtal is required for R–4 F.F. Operation

UNIT PRICE: $7.85

Variable Frequency Operation with:

T–4X
T–4XB
T–4XC
R–4
R–4A
R–4B
R–4C
SW–4

Xtal Freq. = low end of Oper. Band in MHz + 11.1

UNIT PRICE: $5.25

Variable Frequency Operation with:

SW–4A Xtal Freq. = low end of Oper. Band in MHz + 11.090

UNIT PRICE: $5.25

Range Crystals for:

2–C Up to 24.0 MHz operation only: Xtal Freq. = low end of Oper. Band plus 4.0.

Over 24.0 MHz:

Xtal Freq. = high end of Oper. Band minus 4.0.

UNIT PRICE: $5.25

Range Crystals for:

2–B Crystals for 2–B are not available. Order 2–C crystals for appropriate range. (Tuning range is in increments of 500 kHz.)

UNIT PRICE: $5.25

Crystals for:

2–NT

FREQUENCY IN MHz		
Band	**Xtal Range**	**Oper. Freq.**
80 M	3.5-3.8	Xtal x 1
40 M	7.0-7.2	Xtal x 1
20 M	7.0-7.125	Xtal x 2
15 M	7.0-7.083	Xtal x 3
10 M	7.0-7.125	Xtal x 4

UNIT PRICE: $7.85

Crystals for:

ML–2

Specify Transmit or Receive and Frequency

UNIT PRICE: $5.25

Crystals for:

TR–22 and TR–22C

Specify Transmit or Receive and Frequency

UNIT PRICE: $7.85

Crystals for:

TR–72

Specify Transmit or Receive and Frequency

UNIT PRICE: $6.30

Crystals for:

TR–33C

Receive Crystals Specify Frequency

UNIT PRICE: $6.30

Offset Crystals Specify Frequency

UNIT PRICE: $7.85

CRYSTAL FREQUENCIES FOR EQUIPMENT WORKING THROUGH REPEATERS

The R. L. Drake Company stocks ML–2, TR–72, TR–22, and TR–33C crystals for the following frequencies which are normally available for immediate shipment. Crystals for other frequencies usually require approximately four weeks for delivery.

HALF DUPLEX FREQUENCIES

Frequency in MHz	
Transmit	Receive
146.01	146.61
146.04	146.64
146.07	146.67
146.10	146.70
146.13	146.73
146.16	146.76
146.19	146.79
146.22	146.82
146.25	146.85
146.28	146.88
146.31	146.91
146.34	146.94
146.37	146.97

SIMPLEX FREQUENCIES

Frequency in MHz	
Transmit	Receive
146.40	146.40
146.43	146.43
146.46	146.46
146.49	146.49
146.52	146.52
146.55	146.55
146.58	146.58

NOTE: Orders for crystals outside the 2 Meter Band will not be accepted.

SPR–4 CRYSTALS

Operating Frequency in MHz	Crystal Frequency in MHz
.15 – .5*	None Required
.5 – 1.0*	11.59
1.0 – 1.5*	12.09
1.5 – 2.0	12.59
2.0 – 2.5	13.09
2.5 – 3.0	13.59
3.0 – 3.5	14.09
3.5 – 4.0	14.59
4.0 – 4.5	15.09
4.5 – 5.0	15.59
5.0 – 5.5	16.09
5.5 – 6.0	16.59
6.0 – 6.5*	17.09
6.5 – 7.0	17.59
7.0 – 7.5*	18.09
7.5 – 8.0	18.59
8.0 – 8.5	19.09
8.5 – 9.0	19.59
9.0 – 9.5	20.09
9.5 – 10.0*	20.59
10.0 – 10.5	21.09
10.5 – 11.0	21.59
11.0 – 11.5	22.09
11.5 – 12.0*	22.59
12.0 – 12.5	23.09
12.5 – 13.0	23.59
13.0 – 13.5	24.09
13.5 – 14.0	24.59
14.0 – 14.5	25.09
14.5 – 15.0	25.59

Operating Frequency in MHz	Crystal Frequency in MHz
15.0 – 15.5*	26.09
15.5 – 16.0	26.59
16.0 – 16.5	27.09
16.5 – 17.0	27.59
17.0 – 17.5	28.09
17.5 – 18.0*	28.59
18.0 – 18.5	29.09
18.5 – 19.0	29.59
19.0 – 19.5	30.09
19.5 – 20.0	30.59
20.0 – 20.5	31.09
20.5 – 21.0	31.59
21.0 – 21.5	32.09
21.5 – 22.0*	32.59
22.0 – 22.5	33.09
22.5 – 23.0	33.59
23.0 – 23.5	34.09
23.5 – 24.0	34.59
24.0 – 24.5	35.09
24.5 – 25.0	35.59
25.0 – 25.5	36.09
25.5 – 26.0	36.59
26.0 – 26.5	37.09
26.5 – 27.0	37.59
27.0 – 27.5	38.09
27.5 – 28.0	38.59
28.0 – 28.5	39.09
28.5 – 29.0	39.59
29.0 – 29.5	40.09
29.5 – 30.0	40.59

*SPR–4 normally supplied with these operating frequencies.

SPR–4 CRYSTAL KITS

PRICE

AMATEUR BANDS – 160 M, 80M, 20 M, 15 M and 10 M ranges. Six crystals cover: $31.20

1.5 – 2.0 MHz 21.0 – 21.5 MHz
3.5 – 4.0 28.0 – 28.5
14.0 – 14.5 28.5 – 29.0

MARINE BANDS – Eleven crystals cover: $57.20

2.0 – 2.5 MHz 8.5 – 9.0 MHz 17.0 – 17.5 MHz
2.5 – 3.0 12.0 – 12.5 22.0 – 22.5
4.0 – 4.5 13.0 – 13.5 22.5 – 23.0
8.0 – 8.5 16.5 – 17.0

AERONAUTICAL OVERSEAS – Seven crystals cover: $36.40

2.5 – 3.0 MHz 6.5 – 7.0 MHz
3.0 – 3.5 8.5 – 9.0
4.5 – 5.0 13.0 – 13.5
5.5 – 6.0

TIME & FREQUENCY STANDARD, WWV – Five crystals cover: $26.00

2.5 – 3.0 MHz 15.0 – 15.5 MHz (original equipment)
5.0 – 5.5 20.0 – 20.5
10.0 – 10.5 25.0 – 25.5

CITIZENS BAND – One crystal and Frequency chart: $5.25

27.0 – 27.5 MHz* (*Generous overtravel gives additional 50 kHz or more off ends of each range.)

TROPICAL BROADCAST – Three crystals cover: $15.60

2.0 – 2.5 MHz 3.0 – 3.5 MHz 4.5 – 5.0 MHz

MARS – Five crystals cover: $26.00

2.0 – 2.5 MHz 4.0 – 4.5 MHz 18.0 – 18.5 MHz
3.0 – 3.5 5.0 – 5.5

TELETYPE COMMERCIAL – UPI, AP, STOCK MARKET, WEATHER, ETC. – Four crystals cover: $20.80

7.5 – 8.0 MHz 13.5 – 14.0 MHz
9.0 – 9.5 15.5 – 16.0

SPR–4 ACCESSORIES

PRICE

MATCHING SPEAKER – Same as SPR-4, has 5 x 7 speaker.
Model MS-4 . . . . $30.00

CALIBRATOR – Plug-in 100 kHz crystal oscillator with harmonics that occur at 100 kHz intervals throughout range of SPR-4.
Model SCC-4 . . . . $20.00

NOISE BLANKER – Plug-in IF type noise blanker mutes receiver for duration of each noise pulse. 18 transistors, 2 diodes.
Model 5-NB $70.00

LOOP ANTENNA – Directional antenna nulls out undesired stations, plugs into receptacle through top of the cabinet. Works from 150 kHz to 1600 kHz only.
Model AL-4 . . . . $29.00

ANTENNA KIT – Consists of wire, insulators, lead-in, and instructions.
Model AN-5 . . . . $ 8.80

DC POWER CORD – Plugs into cigarette lighter in an automobile, allows SPR-4 to be used on 12 Volts DC supply.
Model DC-PC . . . . $ 5.00

TRANSCEIVE ADAPTOR – Allows SPR-4 to transceive with T-4 or T-4X series Transmitters. Consists of printed circuit board and connectors. Must be wired into SPR-4 by technician.
Model TA-4 . . . . $35.00

TELETYPE ADAPTOR – Allows reception of standard teletype tones 2125/2975 Hz and 2125/2295 Hz by remote shifting BFO.
Model RY-4 . . . . $20.00

MMK-3, Mobile Mount Kit $10.95
DIAL, Crystal Selector, Plain . . . . $ 3.00
WORLD RADIO & TV HANDBOOK $10.95

R. L. DRAKE COMPANY
540 Richard Street
Miamisburg, Ohio 45342

DRAKE

CRYSTAL ORDER FORM

Take this order form to your dealer or mail it directly to:

R. L. DRAKE COMPANY
540 Richard Street
Miamisburg, Ohio 45342

ATTN: Sales Department

Special crystals or Fixed Frequency crystals cannot be returned for refund. Crystals are shipped POSTPAID to U.S., Canada and Mexico upon receipt of U.S. funds. Add 13 cents per crystal for Air Mail.

NAME______________________________

STREET______________________________

CITY____________ STATE____________ ZIP ________

BE SURE TO SPECIFY THE RADIO MODEL NUMBER for which the crystals are intended.

RADIO MODEL NUMBER	OPERATING FREQUENCY (MHz)		CRYSTAL FREQUENCY (MHz)	QTY.	TOTAL	
	Transmit	Receive				
				Sub Total		
				Ohio residents add 4.5% Sales Tax		
				NOTE: FOR ORDERS OF LESS THAN $15.00, ADD $1.00 HANDLING CHARGE.		
				PLEASE SEND CHECK OR MONEY ORDER WITH ORDER . . . . **TOTAL**		

Prices subject to change without notice.

R. L. DRAKE COMPANY

TV-3300-LP LOW PASS FILTER

FEATURES:

Prevents spurious outputs to the antenna that cause TVI from transmitters operating below 30 MHz.

Stops 2nd and 3rd harmonics on 15 and 10 meter amateur bands and 3rd harmonic of 20 meters.

Stops 2nd and 3rd harmonics of CB Band.

Protects all World TV channels.

Protects TV IF frequencies above 36 MHz.

Has low transmitter loss below 30 MHz.

SPECIFICATIONS:

Transmitter Operating Range:	0 to 30 MHz.
Design Cutoff Frequency:	33 MHz.
Attenuation:	Greater than 80 dB above 41 MHz.
Insertion Loss:	Less than 1/4 dB below 29 MHz. Less than 1/3 dB at 30 MHz.
Power Capacity:	1000 Watts average.
Impedance:	52 Ohms input and output.
Connectors:	UHF type SO-239 sockets.
Dimensions:	8-1/2" x 2-1/2" x 2-1/2".

INSTALLATION:

Before installing the filter, make certain your transmission line has a low SWR. This also applies to the link between antenna coupler and transmitter when the filter is installed here. CAUTION: Do not disconnect the antenna transmission line from the filter or otherwise disturb the load with your transmitter operating. Removing the load from the filter may cause it to break down. Install the filter on the transmitter cabinet and bond to it using the mounting holes provided. Make up a short coax cable with proper connectors (PL-259) to go between the transmitter output and filter input. Keep this unfiltered lead outside the cabinet as short as possible. Connect the antenna coax (PL-259 connector) to the output of the filter.

NOTE:

Few TV receivers have sufficient selectivity to discriminate between low channels and a strong transmitter signal. This is the fault of the receiver design, and will not be helped by the installation of a low pass filter at the transmitter. This interference condition may be remedied by installing a Drake TV-300-HP high pass filter at the TV receiver.

R. L. DRAKE COMPANY, 540 Richard Street, Miamisburg, Ohio 45342

TR-3/TR-4/TR-4C/TR-4Cw TUNING ALTERATIONS

The tune up procedure for the TR series transceivers must be altered from the instruction manual in order to meet section 97.73 of the F.C.C. regulations which concerns the purity of emissions.

Tune up on 80, 40, and 15 meters must be altered by limiting the plate current to 350 milliamperes with the LOAD control. Instead of adjusting the LOAD control for maximum RF output, the LOAD control should be advanced from CCW to the point at which the resonant plate current does not exceed 350 milliamperes. On 80 meters the LOAD control should remain fully CCW.

The tune up procedure in the instruction manual may be followed for operation on 20 and 10 meters.

(CCW -- counterclockwise)

T-4/T-4X/T-4XB/T-4XC TUNING ALTERATIONS

The tune up procedure for the T-4 series transmitters must be altered from the instruction manual in order to meet section 97.73 of the F.C.C. regulations which concern the purity of emissions.

Tune up on 160, 80, 40 and 20 meters must be altered by limiting the plate current to 340 milliamperes with the LOAD control. Instead of adjusting the LOAD control for maximum RF output, the LOAD control should be advanced from CCW to the point at which the resonant plate current does not exceed 340 milliamperes.

The tune up procedure in the instruction manual may be followed for operation on 15 and 10 meters.

(CCW -- counterclockwise)

L-4B

The L-4B when tuned in accordance with the instruction manual meets the requirements of section 97.73 of the F.C.C. regulations which concern the purity of emissions.

INSTALLATION INSTRUCTIONS
TV-1000-LP Low Pass Filter

Before installing the filter, make certain your transmission line has a low SWR. This also applies to the link between antenna coupler and transmitter when the filter is installed here. CAUTION: Do not disconnect the antenna transmission line from the filter or otherwise distrub the load with your transmitter operating. Removing the load from the filter may cause it to break down. Install either filter on the transmitter cabinet and bond to it using the mounting holes provided. Keep the unfiltered lead outside the cabinet as short as possible.

Six Meter Operation of the Drake TV-1000-LP Low Pass Filter

It is very difficult to design and manufacture a filter with a cutoff as sharp as the TV-1000-LP. Manufacturing tolerances must be held to very close limits.

TV-1000-LP filters are carefully checked with a 52 ohm resistance load and a wide band sweep generator. The condensers are checked to the design tolerance and each coil is adjusted to get the proper cutoff shape and frequency, and to achieve the proper maximum attenuation frequencies.

The closer to cutoff that a filter is used, the more the VSWR will be changed by insertion of the filter. If the line is absolutely flat (1:1 VSWR), before inserting the filter, then the filter can be operated closer to cutoff without much change in VSWR.

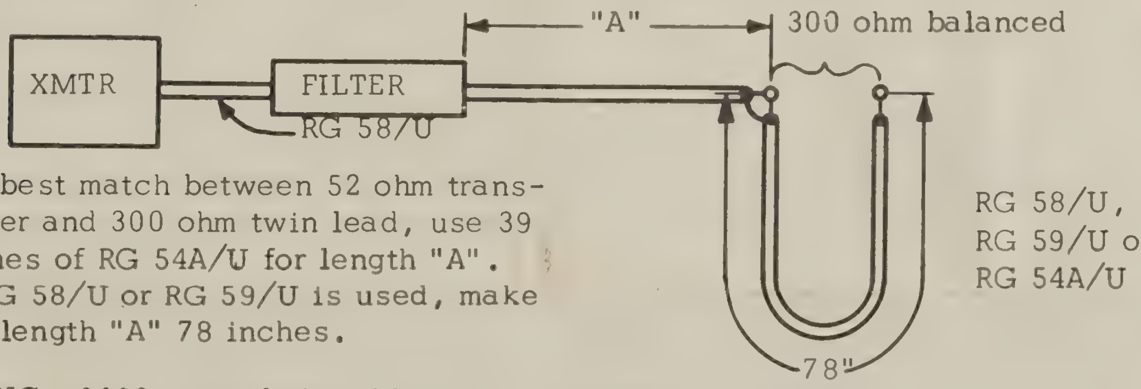
If you can insert a quarter wave piece of transmission line into your line without affecting your transmitter loading or the indicated VSWR, then only can you get best filter cutoff, attenuation and minimum VSWR disturbance.

Many hams believe that a filter operates as through its input and output terminals were connected together in the "pass" frequency range, and that the input and output terminals are shorted to ground in the "attenuate" frequency range. This is not true. The ideal filter could be replaced by some definite length of transmission line in the "pass" range. In the "attenuate" range the filter could be replaced by the series and shunt reactances which would produce some definite value of attenuation.

Fortunately, a moderate increase in VSWR when the filter is inserted, will not increase losses or spoil the attenuation characteristics of a filter materially. Your transmitter loading may decrease or increase with the filter in the circuit, and your receiver S-meter reading may decrease or increase. A change in transmitter loading should be all that is necessary to bring its input back to normal and the antenna power back to normal.

The receiver situation is not as easy, because few receivers provide any matching facilities at the antenna input. If the LP filter is not needed in the receiver circuit to cut out TV and FM interference, the best solution is to put the filter in the transmitter lead only. If it is desired to use the filter in the receiver also, it will be necessary to juggle the length of line from the filter to the receiver or provide some other means of restoring the impedance match. Just remember, the energy is still there and is not dissipated. It can go into the receiver if the match is restored.

To match filter to 300 ohm balanced line for 6 meter band:



For best match between 52 ohm transmitter and 300 ohm twin lead, use 39 inches of RG 54A/U for length "A". If RG 58/U or RG 59/U is used, make the length "A" 78 inches.

RATING: 1000 watts below 30 MC - 200 watts on 6 meters

NOTE: Few TV receivers have sufficient selectivity to discriminate between low channels and a strong 6-meter signal. This is the fault of the receiver design and will not be helped by the installation of a low pass filter at the transmitter. This interference condition may be remedied by installing a new style Drake TV-300-HP high pass filter at the TV receiver.

R.L. DRAKE COMPANY, 540 RICHARD ST., MIAMISBURG, OHIO 45342

DRAKE MODEL 7077 MICROPHONE INSTRUCTION SHEET

Kiell Mike

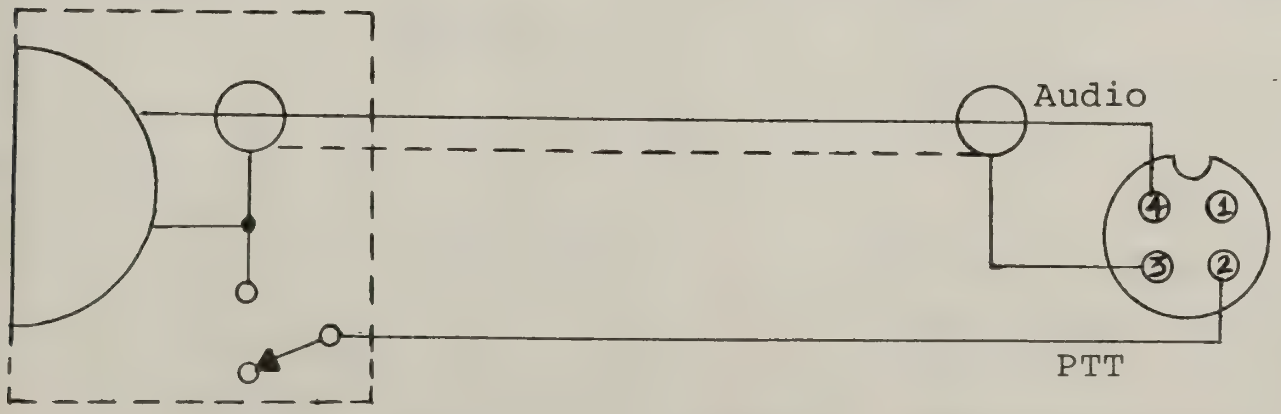
The Drake Model 7077 Microphone is factory wired for use with the Drake TR7 Transceiver in either the push-to-talk or VOX mode. The microphone is wired in accordance with the following chart (pin numbers are molded on the front of the plug):

Pin No.	Function
1	Mic. Audio (Low Level Option)
2	Push-To-Talk
3	Ground (Audio & PTT)
4	Mic. Audio (Factory Wired)

> **NOTE**
>
> **Alternate Wiring For TR7 Transceivers With Serial Numbers Above 1400**
>
> If your operating habits require additional microphone gain, you may find it beneficial to move the microphone audio line to connector pin 1. This provides approximately 8 dB of additional gain for the audio and VOX channels. For transceivers with serial numbers below 1400, contact the factory regarding modification.

SPECIFICATIONS:

Type:	Dynamic, High Impedance
Output:	-48 dB @ 1 kHz (0 dB = 1 volt/microbar)
Frequency Response:	300 - 5000 Hz
Switching:	VOX or push-to-talk
Connector:	4-pin, compatible with TR7



Model 7077 Schematic Diagram

DRAKE

CRYSTAL ORDER FORM

Fixed Frequency Operation with:

T–4
T–4B
T–4X*
T–4XB*
T–4XC
R–4A
R–4B

For operation below 10 MHz, Xtal Freq. = Oper. Freq. + 5.645.

For operation above 10 MHz, Xtal Freq. $= \frac{\text{Oper. Freq.} + 5.645}{2}$

*Modified for fixed frequency operation

UNIT PRICE: $7.85

Fixed Frequency Operation with:

R–4 Xtal Freq. = Oper. Freq. + 11.1. A 5.455 MHz lock Xtal is required for R–4 F.F. Operation

UNIT PRICE: $7.85

Variable Frequency Operation with:

T–4X
T–4XB
T–4XC
R–4
R–4A
R–4B
R–4C
SW–4

Xtal Freq. = low end of Oper. Band in MHz + 11.1

UNIT PRICE: $5.25

Variable Frequency Operation with:

SW–4A Xtal Freq. = low end of Oper. Band in MHz + 11.090

UNIT PRICE: $5.25

Range Crystals for:

2–C Up to 24.0 MHz operation only: Xtal Freq. = low end of Oper. Band plus 4.0.

Over 24.0 MHz:

Xtal Freq. = high end of Oper. Band minus 4.0.

UNIT PRICE: $5.25

Range Crystals for:

2–B Crystals for 2–B are not available. Order 2–C crystals for appropriate range. (Tuning range is in increments of 500 kHz.)

UNIT PRICE: $5.25

Crystals for:

2–NT

FREQUENCY IN MHz		
Band	**Xtal Range**	**Oper. Freq.**
80 M	3.5-3.8	Xtal x 1
40 M	7.0-7.2	Xtal x 1
20 M	7.0-7.125	Xtal x 2
15 M	7.0-7.083	Xtal x 3
10 M	7.0-7.125	Xtal x 4

UNIT PRICE: $7.85

Crystals for:

ML–2

Specify Transmit or Receive and Frequency

UNIT PRICE: $5.25

Crystals for:

TR–22 and TR–22C

Specify Transmit or Receive and Frequency

UNIT PRICE: $7.85

Crystals for:

TR–72

Specify Transmit or Receive and Frequency

UNIT PRICE: $6.30

Crystals for:

TR–33C

Receive Crystals Specify Frequency

UNIT PRICE: $6.30

Offset Crystals Specify Frequency

UNIT PRICE: $7.85

CRYSTAL FREQUENCIES FOR EQUIPMENT WORKING THROUGH REPEATERS

The R. L. Drake Company stocks ML-2, TR-72, TR-22, and TR-33C crystals for the following frequencies which are normally available for immediate shipment. Crystals for other frequencies usually require approximately four weeks for delivery.

HALF DUPLEX FREQUENCIES

Frequency in MHz	
Transmit	Receive
146.01	146.61
146.04	146.64
146.07	146.67
146.10	146.70
146.13	146.73
146.16	146.76
146.19	146.79
146.22	146.82
146.25	146.85
146.28	146.88
146.31	146.91
146.34	146.94
146.37	146.97

SIMPLEX FREQUENCIES

Frequency in MHz	
Transmit	Receive
146.40	146.40
146.43	146.43
146.46	146.46
146.49	146.49
146.52	146.52
146.55	146.55
146.58	146.58

NOTE: Orders for crystals outside the 2 Meter Band will not be accepted.

SPR–4 CRYSTALS

Operating Frequency in MHz	Crystal Frequency in MHz
.15 – .5*	None Required
.5 – 1.0*	11.59
1.0 – 1.5*	12.09
1.5 – 2.0	12.59
2.0 – 2.5	13.09
2.5 – 3.0	13.59
3.0 – 3.5	14.09
3.5 – 4.0	14.59
4.0 – 4.5	15.09
4.5 – 5.0	15.59
5.0 – 5.5	16.09
5.5 – 6.0	16.59
6.0 – 6.5*	17.09
6.5 – 7.0	17.59
7.0 – 7.5*	18.09
7.5 – 8.0	18.59
8.0 – 8.5	19.09
8.5 – 9.0	19.59
9.0 – 9.5	20.09
9.5 – 10.0*	20.59
10.0 – 10.5	21.09
10.5 – 11.0	21.59
11.0 – 11.5	22.09
11.5 – 12.0*	22.59
12.0 – 12.5	23.09
12.5 – 13.0	23.59
13.0 – 13.5	24.09
13.5 – 14.0	24.59
14.0 – 14.5	25.09
14.5 – 15.0	25.59

Operating Frequency in MHz	Crystal Frequency in MHz
15.0 – 15.5*	26.09
15.5 – 16.0	26.59
16.0 – 16.5	27.09
16.5 – 17.0	27.59
17.0 – 17.5	28.09
17.5 – 18.0*	28.59
18.0 – 18.5	29.09
18.5 – 19.0	29.59
19.0 – 19.5	30.09
19.5 – 20.0	30.59
20.0 – 20.5	31.09
20.5 – 21.0	31.59
21.0 – 21.5	32.09
21.5 – 22.0*	32.59
22.0 – 22.5	33.09
22.5 – 23.0	33.59
23.0 – 23.5	34.09
23.5 – 24.0	34.59
24.0 – 24.5	35.09
24.5 – 25.0	35.59
25.0 – 25.5	36.09
25.5 – 26.0	36.59
26.0 – 26.5	37.09
26.5 – 27.0	37.59
27.0 – 27.5	38.09
27.5 – 28.0	38.59
28.0 – 28.5	39.09
28.5 – 29.0	39.59
29.0 – 29.5	40.09
29.5 – 30.0	40.59

*SPR–4 normally supplied with these operating frequencies.

SKYTEC CW-1 SPEAKER OWNER'S MANUAL

The Skytec CW-1 speaker system is designed expressly for reproducing CW radio telegraphy. It has good "single frequency" selectivity, yet has a most pleasant tone quality, a real boon to lengthy CW operation. By filtering right at the audio output to the room, the CW-1 supresses hum, hiss, ringing and miscellaneous noises that are injected into the audio after the filter stages in most receivers.

SYSTEM DESCRIPTION: The CW-1 combines an acoustic filter resonant at about 750 Hz with a loudspeaker in an attractive and rugged enclosure. A sleeve in the unit's output opening may be extended to lower the resonant frequency as desired, down to about 600 Hz.

An RCA type jack at the rear of the unit accepts 8 ohm audio input. A miniature phone jack at the rear and a switch at the front provide convenient switching from the CW-1 to a wider range speaker for other than CW reception. One RCA type pin plug-to-miniature phone plug cable is furnished.

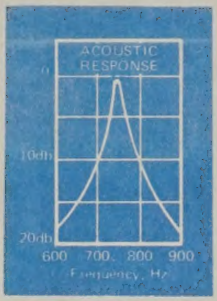
INSTALLATION: Cable the RCA type jack at the rear of the CW-1 to the receiver audio output, and place the front switch "up". The CW-1 will operate.

Cable the regular station speaker in turn to the miniature phone jack at the rear of the CW-1 and flip the switch "down". The receiver audio will now by-pass the CW-1 to the other speaker.

OPERATING: With the sleeve inserted fully into the front opening of the CW-1 (as it is shipped), and using the widest band pass available in your receiver, tune around a CW band to get familiar with the tone of the unit. Pick a strong signal, or switch in the receiver calibrator and tune slowly across it, noting the pitch and "boost" of the signal at the unit's resonant frequency.

Next, try a few weak signals and signals nearly buried in QRM and QRN. Switching back and forth between the CW-1 and the other speaker while listening to these signals will demonstrate the improvements in selectivity, signal-to-noise and tone quality provided by the CW-1.

Now, use the CW-1 in QSO's and enjoy the most pleasant CW operating ever!



Serial number 1383
is resonant at 785 Hz
with the sleeve removed.

THE TONE ADJUSTING SLEEVE: With the sleeve fully inserted the resonant frequency is about 25 Hz lower than the frequency shown above. Pulling the sleeve out ¾ inch lowers the resonant point another 75 Hz. Use the setting you like best, or vary it as desired while operating. The system "Q" stays about the same at any setting, or with the sleeve removed.

NARROW PASS-BAND FILTERS: To use the CW-1 to advantage with a narrow filter ahead of it requires that they have their pass bands centered at the same frequency. Where the filter is in the receiver ahead of the detector, this is readily accomplished by centering the signal in the filter's pass band, then adjusting the BFO for the audio pitch at which the CW-1 is resonant. Other filters may or may not be usable to advantage with the CW-1, depending on whether or not their peak may be set such that the audio pitch is within the response span of the CW-1.

PRINCIPLE OF OPERATION: In the CW-1, back radiation from a loudspeaker mounted vertically near the base of the unit is deadened by sound-absorbent material. A cylindrical sound chamber (tube) is coupled to the front of the speaker through only a small hole in a plate that otherwise closes the lower end of the tube. The upper end of the tube is open to the room.

At the frequency at which the chamber length is one-quarter wave acoustically, it is resonant and acts as a matching section between the high impedance to sound of the small hole at the speaker end, and the low impedance to the room of the open end. Audio energy transfer is very efficient at this frequency, but falls off sharply as the frequency departs from resonance, the selectivity being determined by the "Q" of the system. The speaker characteristics, chamber diameter, coupling hole size, and materials and construction are all critical to the high acoustical Q of the CW-1.

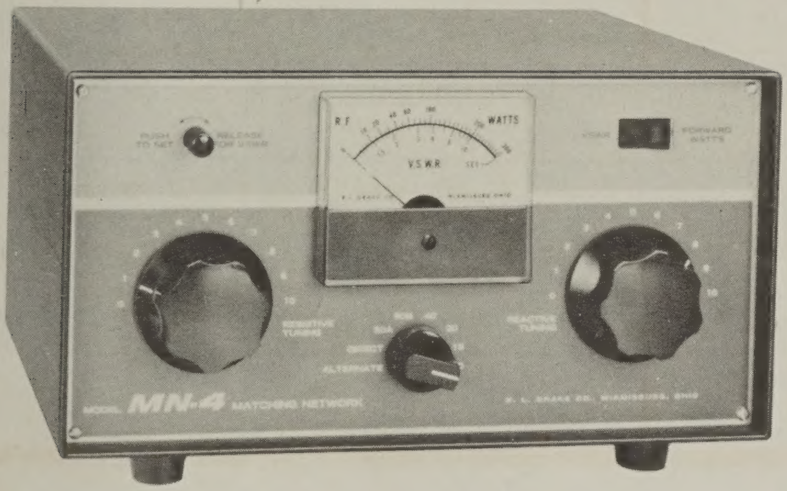
SKYTEC
444 Crestview Dr.
Ukiah, CA 95482

Mailing address:
Box 535
Talmage, CA 95481

R. L. DRAKE

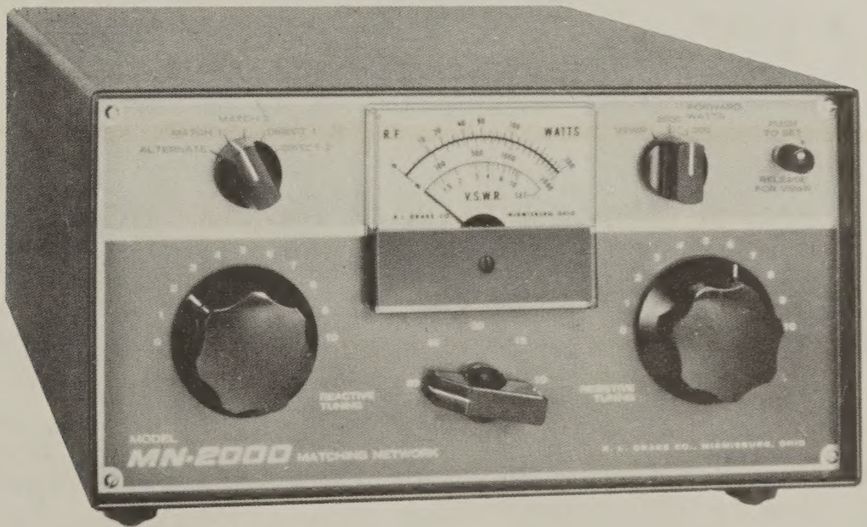
Models MN-4 and MN-2000

Matching Networks



A Drake MN-4 or MN-2000 matching network is a worthwhile addition to any amateur station where peak performance is desired. Basically identical, except for power handling capabilities, the MN-4 and MN-2000 enable feedline S.W.R.'s of 5:1 to be matched to the transmitter. If input impedance is purely resistive, even higher S.W.R.'s can be handled.

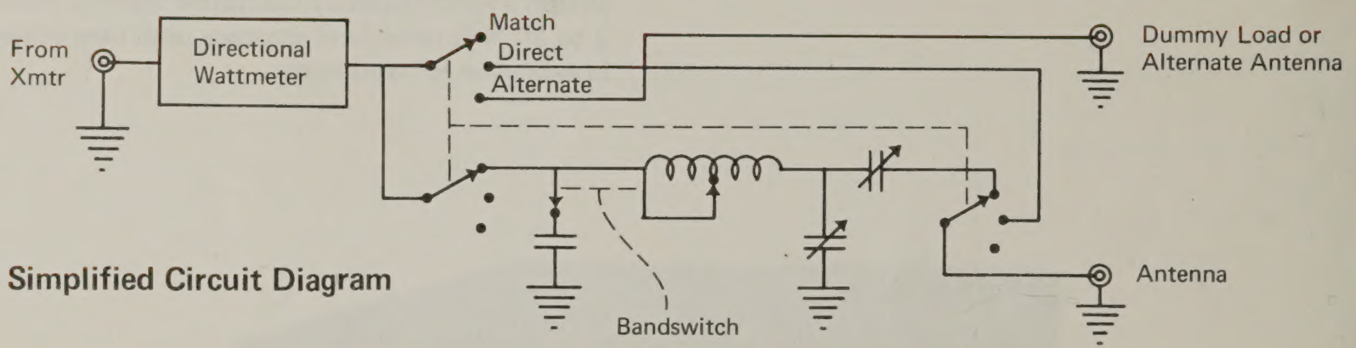
Besides presenting a 50 ohm load to the transmitter, the Matching Network's built in RF wattmeter allows accurate and continuous power measurement and V.S.W.R. indication. The advanced techniques employed in the wattmeter circuitry yield frequency-insensitive readings throughout the 2 to 30 MHz range, and accuracy until now obtainable only in expensive RF wattmeters.



Prices and specifications subject to change without notice

R. L. DRAKE COMPANY 540 Richard Street, Miamisburg, Ohio 45342

SPECIFICATIONS		MN-4 & MN-2000	
FREQUENCY COVERAGE:		3.5 to 4.0 MHz, 7.0 to 7.3 MHz, 14.0 to 14.35 MHz, 21.0 to 21.45 MHz, 28.0 to 29.7 MHz	
INPUT IMPEDANCE:		50 ohms (resistive)	
LOAD IMPEDANCE:		50 ohm coax with VSWR of 5:1 or less (any impedance angle) 75 ohm coax at a lower VSWR can be used.	
METER:		Reads forward power in watts, or VSWR	
INSERTION LOSS:		0.5 dB or less on each band after tuning	
		MN-4	MN-2000
POWER CAPABILITY:		200 watts RF continuous	1000 watts RF average continuous Duty, 2000 watts PEP
WATTMETER ACCURACY:		± 5% of reading + 2 watts	± (5% of reading + 2 watts) on 200 watt scale, ± (5% of reading + 20 watts) on 2000 watt scale
DIMENSIONS (including connectors)		5½ H x 10¾ W x 8½ D	5½ H x 10¾ D x 14⅜ D
FRONT PANEL CONTROLS		Resistive Tuning, Reactive Tuning, VSWR Calibration, Bandswitch, Watts/VSWR Selector Switch	
		- - -	Antenna/Dummy Load Switch
REAR PANEL CONTROLS		Ground Post and three SO-239 Connectors: one for input, two for outputs.	Ground Post and four type SO-239 connectors One for input, two for outputs, one for Alternate Antenna/Dummy Load
SHIPPING:	Weight	9 lbs.	18 lbs.
	Dimensions	11¾ x 8 x 10¼"	18 x 9 x 15"



Simplified Circuit Diagram

Matching Network Applications

Besides presenting a 1:1 S.W.R. to the transmitter from a wide range of loads, the matching networks allow perfect matching of the input impedance of high-power linear amplifiers to the output impedance of the exciter used.

The most attractive feature for space-limited antenna installations is the MN-4 and MN-2000's capability of obtaining optimum performance from multi-band antennas, as well as keeping a perfect match for the transmitter for one-band antennas across the whole band.

The MN-4 and MN-2000 will directly and continuously monitor transmitter output.

The 25 to 35 dB additional second harmonic attenuation may eliminate the need for a TV I low-pass filter.

The matching networks can also "store" transmitter loading when switching from barefoot to linear operation.

The MN-4's "Alternate" position allows easy switching to another antenna or to a dummy load for off-the-air tuneup. In the direct position the matching network is bypassed, but power and V.S.W.R. are still measureable, allowing actual feedline V.S.W.R. to be measured.

The MN-2000 features two independent antenna receptacles as well as the alternate position described for the MN-4. With this arrangement, front panel switching from one antenna to the other, with or without matching network in line, is possible.

The MN-4 and MN-2000 help locate antenna problems, match an antenna to a transmitter with fixed loading, and perform a myriad of other useful functions.

R. L. DRAKE COMPANY 540 Richard Street, Miamisburg, Ohio 45342